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Editorials

NEW DEAL PASSES FROM LAW AND ECONOMICS TO TAMPER WITH THE NATIONS HEALTH

What a political spoils system might do to medicine—in fact probably *will* do—has been well set forth by one of the best informed men in the world today upon our changing social systems. No less an authority than David Lawrence, an economic commentator, wrote recently from Washington, D. C., in a syndicated news letter in the *New York Sun,* August 26, 1937, under the title "NEW DEAL PASSES FROM LAW AND ECONOMICS TO TAMPER WITH THE NATION'S HEALTH" reprinted from coast to coast upon what he terms in competent phraseology is "the new deal's latest experiment which may prove the entering wedge for socialized medicine in America, some time called the placing of medical care upon a quantity production basis."

The underlying motif of this article of Mr. Lawrence is so analagous, ay, so almost practically parallel with the doctrines which have been advocated so strenuously for two decades in the editorial columns of the ILLINOIS MEDICAL JOURNAL that it seems well to quote extensively from the article of Layman Lawrence. If the rest of the general public could but be awakened to the dangers that confront not only private lives but private individualism when the American system of individual rights without tyrannical supervision by the ever-increasing menace in the substitution of socialism then might all honest Americans cry not only "Amen," but shout "Hallelujah."

In part says Mr. Lawrence:

"Like all New Deal 'experiments,' the plan to provide medical care by the group method is limited in scope at first. It is to apply for the present to the employes in Washington of the Home Owners Loan Corporation and the Federal Home Loan Bank Board, but it is so set up that it can just as readily be extended to all the 117,000 Federal employes here and the 700,000

or more Government employes throughout the country.

"Doctors have long suspected that the New Deal would seek to introduce 'socialized medicine,' but assurances to the contrary have come as usual from time to time from high quarters. The importance of the new experiment will be minimized in official quarters *so as to discourage opposition and the plan will be compared to various group health plans in private industry.* But the new organization, nevertheless, is directly in line with what has been urged by persons inside the administration who see the job possibilities and patronage potentialities of a medical bureaucracy in the Government. The latest step, therefore, may be taken to mean that the campaign for 'socialized medicine' has begun.

"The objections to this form of medical care are numerous and the best testimony is that which comes from experts who have studied the health insurance systems abroad."

Quoting those savants, Mr. Lawrence proceeds, first as to Great Britain.

"Thus, Sir E. Farquhar Buzzard, president of the British Medical Association, said recently in a public address:

" 'The chief flaw in a badly organized service, such as that which has evolved in this country during the last century, is lack of time, and both the general practitioner and the consultant, in order to earn a living wage, are frequently obliged to undertake far more work than they can deal with efficiently in the hours at their disposal.' "

As to Germany where medicine has been martyred to conform to theoretical and political statistics Layman Lawrence cites Dr. Paul G. Frank, a most reputable practitioner, who avers, "For almost thirty years I have worked as a German panel doctor under the conditions of compulsory health insurance, and for many years I was a member of the physicians committee. During this period I witnessed a deterioration of the medical profession. It came about by the removal of the sanctions of preferment by skill and the substitution of preferment to convenience."

From Austria—sacrified state both politically and practically as well as socially, scientifically and economically comes the voice of Dr. Jacob L. Moreno, who is an authority on the Austrian experience, who states flatly that:

"No physician is capable of properly treating the large number of patients sent him under sickness insurance. He is forced to evolve some mass production plan of operating his office to run people through his mill as fast as possible. The 'rush' system of handling patients is inevitable. When the technic of getting them in and out fast is perfected, the doctor begins to lose that intangible something which is vital to both himself and his patients—his morale. I do not know any doctor who remained long at this sort of practice in Austria who did not become hardened."

Now again citing from Layman Lawrence, whose figures coincide with medical statistics: "America's death rate, if the Southern States where large Negro populations live are eliminated, will be found to be lower than that of any of the countries where Government insurance schemes prevail. Likewise four leading countries which have the lowest death rates do not have compulsory health insurance. These are Australia, Union of South Africa, New Zealand and Canada. In South America, *Chile, which has compulsory health insurance, has a death rate of 26 per thousand inhabitants every year, while Argentine has* 11 *per thousand and Uruguay* 10 *per thousand, and neither of these last two countries has a government insurance system.*"

Dr. F. S. Winslow, president of the Medical Society of the State of New York adds this comment: "In Europe under compulsory health insurance and 'panel practice,' it is noted that, 'many physicians are required to see forty to sixty patients a day—some average 100. This is far too many. Why do not British doctors complain? It should be remembered that health insurance has existed as part of the Government in England since 1911. British physicians who see its great defects are 'cagey' in their public statements derogatory of a system in which so many physicians and bureaucrats are dependent.' "

From Dr. William J. Mayo of the Mayo clinic in Minnesota comes this opinion:

"We of the medical profession are determined that we will not be subjected to political interference. We will not sacrifice the spiritual values of our profession for the small material gain held out to us by political and social experimenters who are attempting now to control the practice of medicine. We refuse to be dictated to by men who are not physicians, who do not understand

the sacred obligation of physicians and their patients."

It would be comforting to feel that Dr. Mayo's stand is both universal and adamantine. But discouragement may be excused in the light of further statement from layman Lawrence in Washington where the stigmata of covert and overt socialization stultifies real Americanism and which reveals that, "Now a large number of doctors would have to be employed by the Government in any national scheme of 'socialized medicine,' but the selection of these doctors by a political spoils system would only be a worse step than the application for Government jobs of doctors not good enough to build for themselves a firm reputation and adequate practice in their own communities. If, for instance, all Government employees in Washington were to be cared for medically under some sort of group plan run by the Government, why should any good doctors stay here? Why should any new ones come here from the best medical schools to replace those who are retiring? Immediately there would be a destruction of incentive and a breakdown in the quality of medical care available to the people of this whole community.

"The new plan to be put into effect in the near future by 'The Group Health Association' among the Home Loan Corporation employees calls for payments of $3.30 a month for men with families and $2.20 a month for single persons.

" 'The service,' it is promised by one of the officials in charge, 'will include medical and surgical examinations, including examination in special departments, such as eye examinations, laboratory tests and X-ray examinations. In each case, complete medical and surgical care will be given.

" 'Hospitalization is to be given in a semi-private room for a period of three weeks during a single illness, without additional charge.'

"The staff of the new clinic is to be headed by Dr. Henry R. Brown of the tuberculosis division of the Veterans Administration and it is planned to hire a staff of about six or seven physicians.

"The charter of the new organization is not restricted to the employees of the Federal Home Loan Bank Board and Home Owners Loan Corporation who are to participate in the group health scheme, but, if successful, the project can be extended to all Government employees inside and outside of the national capital. The dues do not include cost of medicines, drugs and surgical appliances nor the expense of dental work, oxygen tanks, radium and deep X-ray treatments, blood transfusions or special nursing service. It is not planned to treat certain types of surgical or nervous disorder cases or to furnish treatment after the medical director recommends confinement in an institution in mental, tubercular, drug or alcohol addiction cases.

"The whole experiment, however, beginning now on a small scale, dovetails with reports current last November that the Social Security Board was studying the possibility of adding a national health insurance project as a part of its program. Comprehensive health insurance, of course, would be borne by the taxpayers and it is estimated as likely to cost 5 per cent of payrolls. The Social Security Board has authority to make research studies on 'related subjects' and health insurance is held to be one of these."

"The New Dealers are seeking to pattern their plans on projects in foreign countries, and it is all a most un-American movement.

"The New Deal has not hesitated to tamper with the economic system, to tamper with the judicial system, and now is reaching out to tamper with the health system of the country. Inasmuch as the Roosevelt administration has encourged a group of office-holding lawyers to seek to undermine the American Bar Association, it would not be surprising, therefore, if the administration, in order to make some sort of showing of approval by members of the medical profession, encouraged the formation of a rival to the American Medical Association to be made up either of doctors ambitious for jobs, or doctors who haven't made good in their communities, who do not have the gumption or initiative to undertake the hazards of private practice, and who prefer instead the 'security' of politically made and bureaucratic jobs," says layman Lawrence in conclusion. And layman Lawrence is right.

How the first step has been taken at Washington to "put the foot into the door" leading to state medicine, compulsory health insurance, government regulation and dictation, as told by David Lawrence, should be read and carefully

digested and its menacing, far-reaching purport noted by every physician in America.

PHYSICIANS! BE SURE OF THE UNDERLYING PURPORT OF ANY DOCUMENT YOU ARE ASKED TO SIGN

Several years ago when Health Insurance Propaganda was first brought forward a few leading medical men signed (?) a Compulsory Health Insurance Programme that they were later to repudiate.

The presentation was so insidious that the real purport of the propaganda was well masked. Down through the years these attempts to seduce medical leaders to the cause of socialized medicine have become more and more ambushed. Their repetition has been equalled only by their determination. One of the most glaring that "went over" so well that the majority of American doctors do not even now realize its sinister purport is the trip "down the river" taken by many well meaning physicians by the sponsors of the American Foundation Survey. On the face of things this survey appeared to be an honest straw ballot as to what doctors all over the country thought of ways and means to improve medical practice. As a matter of fact it was a stratagem as clever as the Wooden Horse of Troy. For later the background of the American Foundation was shown to be the most outspoken agitation for government control of medicine, governmental centralized medicine, and control of everything medical under the sun, along the Russian system of bureaucratic Governmental Control of everything controllable. Now directly following comes the so-called (and self-appointed!) "Committee of 430" which purports to be the lead batallion in a secession from the American Medical Association and all that it represents. The movement started in New York, where, following the publication of the report of the American Foundation referred to above, this group assembled, formulated certain principles and proposals which are now in circulation for signature among the medical men of the United States, and which, no matter how seemingly honest they appear on the surface, are nothing more nor less than another step in socialistic propaganda affecting the medical profession and through it a true Americanism.

It took six months for the nucleus of this group to get 430 signatures to their promulgated ideas. A statement of their proposals and principles was released to the public press on November 7. The gist of it all was that it made the general public believe that there is a medical rebellion *for state medicine in America,* and against the campaign of the American Medical Association in its attempt to prevent co-operative practice, sickness insurance and other socialistic changes in medical practice. In the last week of November still another group (albeit undoubtedly bound with the same string) began sending out proposals for physicians' signatures suggesting enabling legislation for sickness insurance. The general inference to be gained by the laity from all this racket is that the A.M.A. is a hive of demagogery from which the rank and file must seceed if they would be heard. Which of course is all hokum. The House of Delegates of the A.M.A. is exactly what its title says it is, and it governs the physicians of America only as they wish to be governed. State medicine WAS VOTED DOWN AT THE ATLANTIC CITY CONFERENCE. This was a bitter pill for the communists, for whom this much must be said—they never give up hope nor acknowledge defeat in an attempt to push their perverted doctrines.

Now comes the word that from at least 10 and perhaps 20% of the original signers of the "430 group" to the A.M.A. has come a disclaimer of signature in that they state that they had requested or will request the removal of their names from the list published, since when they affixed their names to the document they were unaware of the nature of this document which they were supposedly signing. Illinois physicians should save themselves this embarrassment by knowing what they are signing before they sign it. Doctors should have learned by now that in any such petitionary circulation as these so-called social improvement affairs the real issue is always so successfully camouflaged that the snake in the grass is a cow in the field compared to the ambush.

Already the so-called "Washington Plan" providing for medical care for Federal Employees and their families in the national capitol has economists aghast. For Federal subsidies come out of taxpayers' pockets and when the tax to pay the government employes' salary is aug-

mented by another tax from Maine to California to pay that employes medical bills then the taxpayer at large—and of such are not the bulk of federal employes—is again the scapegoat.

In the face of such subsidies the private practice of medicine in Washington, D. C. will have a hard time to survive, if not an impossible one. Similar organizations are already being planned in Denver, Kansas City, New Orleans and San Francisco from fragments of news seeping out of high places.

A cursory examination of the men who signed —"The 430" shows that many of the names affixed to that document are those of men whose names and actions are directly opposed to the views they are "signed up" as holding. Obviously some of those men must have affixed their signatures without reading what they were signing and were taken in merely by seeing the names of men who they knew held ideas analagous to their own, and which were already affixed.

It pays to read before you sign, and, better still, if in doubt get in touch with the officers of the medical societies in which you hold membership. Investigate first: sign afterwards.

CARBON TETRACHLORIDE IS EVEN MORE DANGEROUS THAN THE CHEMICALS WHICH IT SUPPLANTS

Insidiousness of chemically instigated industrial hazards, has been brought home with drastic emphasis to the American public through unfortunate, cumulative sequelae from negligent use of radium in various phases of manufacturing. Frequently with which similar chemical perils may be encountered in almost any industry reveals appalling lack of preventive research or only to often, even of humane suspicion of perilous possibilities.

Yet in the bulk of manufacturing and industrial processes lurk untold dangers as menaces to health and even to life. Such exist in the various carbon tetrachlorides, too hastily accepted as sadly needed substitutes for analogous, yet inflammable, solvents or constituents, and without due regard to toxic properties,—especially those that are vaporous,—and that make the carbon tetrachlorides highly objectionable unless used with clear and unremitting caution.

Hardly a week passes that there is not reported some disaster from even such comparatively simple chemical preparations as various dry-cleaning mixtures, calculated for use by the amateur cleaner in the home, or in great dry-cleaning plants and which are based either upon carbon tetrachloride or some one of the carbon tetrachloride products.

It is generally accepted that there are at least three major forms of poisoning for human beings that may be brought about by carbon tetrachloride:—i. e., 1. contact dermatitis; 2. asphyxiation; 3. acute and subacute poisoning. Asphyxiation, which resembles chloroform anesthesia, is brought about only by gross exposure. It is estimated that as little as 100 parts of carbon tetrachloride vapors per million parts of air stands as the beginning limit of danger to those exposed. Characteristic symptoms of acute and subacute carbon tetrachloride poisoning are:—slight headache, nausea, mental confusion, loss of weight, nervousness, secondary anemia, slight jaundice, chronic spasms of the muscles, necrosis of the liver, acidosis, phosphaturia, irritative nephritis, loss of consciousness, coma, such visual disturbances as blurred vision and color confusion and disturbances of near vision.

Carbon tetrachloride is placed at the head of the list of chemicals that can produce liver injury. This poisonous effect can reach the liver by 1. inhalation through the lungs; 2. absorption from the injured skin, or absorption from the digestive tract when administered orally. Then follow injury to kidneys, disturbance of the gastrointestinal tract and evil affections of the hematopoietic and the central nervous system.

When absorbed by the body in large doses, carbon tetrachlorides produce acute symptoms involving these organs. Fatal cases have been recorded from over-doses. In such cases there results an acute toxic necrosis of the hepatic cells with a clinical picture and pathological findings similar to those discovered in acute yellow atrophy or acute hepatitis.

In the kidneys, is shown the pathological changes of nephrosis, and albumin, and casts appear in the urine associated with renal subfunction; nausea, vomiting, and diarrhea are common; the central nervous system is affected, and profound dizziness, syncope and even temporary unconsciousness may occur. When the absorption is made from smaller doses and over an extended period of time, though the acute manifes-

tations are less conspicuous, the result is the same where the liver is concerned.

Retrograde changes take place too in the kidneys and the hematogenic organs and in the circular (?) nervous system after continuous exposure to carbon tetrachloride of low concentrations. Carbon tetrachloride is related chemically to chloroform, another chemical famous for its productions of liver injury.

There are unexpected instances in the history of poisoning from carbon tetrachlorides. For example there is medical record of carbon tetrachloride poisoning in a workman who used carbon tetrachloride for cleaning old telephones. Alice Hamilton is cited as noting the danger in carbon tetrachloride as a fire extinguisher in a closed space, under which conditions phosgene is generated. Under date of July 7, 1932, there was a fire in a New York subway when a standard fire extinguisher was used, and 150 persons were overcome by the fumes which were held to be probably a mixture of carbon tetrachloride, phosgene and chlorine.

In 1919 from Portsmouth Navy Yard come report of two men who died from fumes produced by plying a fire extinguisher upon the clothes of one man, when the garments caught fire.

There is record, too, of a case of a man who fumigated a small room by spraying with what was found to be carbon tetrachloride and an hour later was smitten with acute poisoning from the chemical.

Medicinally carbon tetrachloride is a powerful narcotic substance, surpassing chloroform, but its depressive effects upon the circulation eschew its use as an anesthetic. Toxicity of the chemical is increased by contact with heat.

Wirtschafter recommends routine examination of the visual fields of workers exposed to the vapor of carbon tetrachloride so as to detect possible toxic amblyopia at an early stage. Beckman warns against carbon tetrachloride therapy in ascariasis because[1] the activity of the worm is increased and[2] the dangers of using this chemical as an anthelmintic are well recognized. Carbon tetrachloride is widely used as a solvent in the rubber industries. It forms the basis of the noninflammable home dry cleaner, "Carbona" as well as for the fire extinguishing fluid sold as "Pyrene." It is an excellent solvent for fats and grease and an excellent inducer of toxic cirrhosis of the liver. The non-inflammability of carbon tetrachloride has led to its substitution for benzine, but the question is now widely discussed as to whether the substitution was ever a wise or even an acceptable one because of the toxicity of its vapors.

This applies also to the use of carbon tetrachlorides as adhesive solvents in surgical uses. In Dec. 26, 1936, writing in the Journal of the A. M. A., Fremont A. Chandler wrote:

"In view of the aroused interest in adhesive solvents since the recent tragic accident in a midwestern university training camp in which two lives were lost, there is danger of exchanging fire hazards for less familiar asphyxiative ones. Benzine or similar products are inflammable and must be protected from open flames or sparks. These products are more efficient in the removal of adhesive tape and of desquamated epithelium. They are well tolerated by young patients. The potential danger of fire is probably only slightly greater than that present in the use of alcohol solutions which are on every training table or cart. On the other hand carbon tetrachloride softens desquamating skin only slightly. Its odor is offensive to children who have had recent anesthetics. Carbon tetrachloride and similar chemicals have definite and dangerous anesthetic properties.

Carbon tetrachlorides have been employed recently as a means of killing foxes without damage to the pelts. (Here is still another danger to wearers of furs. For since the vapor is heavy —a feature which enhances its use as a fire extinguisher it is difficult to thoroughly eliminate it from the long silky hairs).

Its use is condemned as an irrigant for the external auditory meatus because of the possibility of leakage into the pharnyx by way of the eustachian tube.

There is also record of cases where indiscriminate use of carbon tetrachloride in removal of adhesives from operative dressings has caused collapse of youthful patients.

A still further indictment against the carbon tetrachlorides emanates from catastrophes eventuating from the use of the chemical in cosmetics, for example shampoo mixtures.

Again citing Hamilton, she has reported the collapse and subsequent death of a womaa while having her hair shampooed with a carbon tetrachoride mixture. *The degree of absorption by*

skin was held in that instance to have been less than that achieved by absorption. The chemical always extracts the fats from the skin and produces a dry condition which favors absorption, and also initiates a dry dermatitis that causes the skin of the hands to crack, frequently producing avenues for secondary pyogenic infections.

The respiratory system is, of course, the greatest absorber. Nausea and vomiting produced by exposure to carbon tetrachloride are due to the reaction upon the circular nervous system and not to local gastric upset.

Emphasis should be placed from the standpoint of inhalation, upon the dangers of using carbon tetrachloride as a remover of grease spots from a closed automobile.

Comment must be made upon the fact that the Egyptian Board of Health in its wholesale treatment of villages for hookworm disease found carbon tetrachloride intoxication "occurring often enough to warrant a routine set of precautions to be enforced within the temporary compounds where all treatments are given."

In February, 1937, writing in the *Ohio State Medical Journal,* Selman and Wirtschafter said:

"Any toxic substance, which is used daily in many homes, sooner or later, is subjected to accidental oral ingestion. The toxic effects of oral ingestion of carbon tetrachloride which has become a common household commodity in recent years, have not received the attention that they merit."

Arraignment proceeds with impetus.

As concluding evidence let me quote from Knud C. Moller, Institute of Pharmacology, University of Copenhagen, who in the Journal of the A. M. A. as far back as Nov. 12, 1932, wrote: "In recent years carbon tetrachloride has found extensive application in a number of different fields and in many different ways. The well-known use of carbon tetrachloride as a fat-solvent, coupled with the fact that it is non-inflammable, has resulted in its wide use during the last few years in dry cleaning. The not infrequent explosions and fires that result from dry cleaning with benzine naturally recommend the use of carbon tetrachloride as a substitute for benzine in work of this kind. The recommendation may be warranted, but it has not been accompanied by any information about the rather high toxicity of carbon tetrachloride and the risk its application may involve if special precautions are not observed. And so, the steadily increasing use of carbon tetrachloride naturally raises the question of the risks that may be incurred by persons who either handle the chemical or are exposed to inhalation of gas fumes.

"Some instances of this inhalation may be cited in the cases of 1. A woman factory worker who suffered from severe headache, nausea, and anemia traced to painting golf ball moulds in which use of carbon tetrachloride was involved; 2. A school janitor poisoned by the use of polishing wax containing the chemical; 3. Five workers at once who were occupied in the preparation of an insecticide containing carbon tetrachloride and in which instance two of the men were very severely poisoned."

Summary of the evidence leads to the emphatic editorial comment that carbon tetrachloride is even more dangerous than the inflammable chemicals which it supplants. Its use should be surrounded with every precaution, and with due information as to its possible dangers supplied to every purchaser of the substance.

This entails an extra responsibility upon members of the medical profession and a decisive action upon their part to enforce chemically protective as well as mechanically protective legistion in industry.

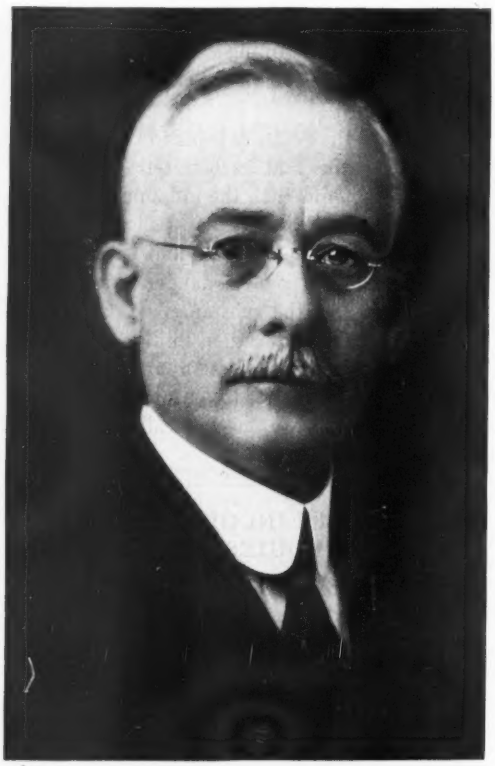
WILLIAM LINCOLN NOBLE, REQUIESCAT

William Lincoln Noble breathed his last on October 14, 1937.

Doctor Noble's work in medicine and among men will not soon be forgotten. His was a genius for friendships and a genius for making men whole. He had too, that rare adaptability, too infrequently seen, for making civic affairs and science go hand in hand. Doctor Noble was one of the few men of our contemporary generation who could fill competently a political job and yet emerge from it free from political effluvium.

For a year Doctor Noble served as superintendent of the Cook County Asylum for the Insane, leaving that post to become County Physician during 1891-2. But two years of such service found him more than ready to take up private practice, and he decided to specialize in the eye and ear. After his graduation from Rush Medical College in 1888, Doctor Noble served his interneship at the Illinois Charitable Eye and Ear

Infirmary, and thus began an affiliation which endured through some forty years, and for the later period of which he was chief of staff of the institution. In 1930, Doctor Noble realized one of his life's greatest ambitions—an appropriation from the State of Illinois for property and for a new building, adjoining the old building housing the Eye and Ear Infirmary on Peoria and Adams streets. This achievement gave Doctor Noble an abiding satisfaction. Through the years he had fought for adequate housing for the



William Lincoln Noble, M D.

institution where he had begun his career and which had received so much of the *real man* that was William Lincoln Noble, that it is doubtful if anywhere anything would have appealed to him half so much as genuine achievement. This achievement was however the last of Doctor Noble's public connections. He was even then seventy years of age and four years later his health began to break. He lived quietly and in semi-retirement in his spacious comfortable home until the day of his death. He is survived by his widow, Mrs. Marion Noble (neé Holden) and two sons and a daughter—William H., a lawyer, Henry H., and Jane, an undergraduate at Skidmore College. Funeral services were held at the First Congregational Church at Evanston with subsequent interment at Graceland Cemetery.

To the practice of his profession, Doctor Noble brought the best of American tradition. The elder of twin sons he had been born on a farm in northern New York, nine miles from Canton, N. Y., the home of that most competent college, St. Lawrence University, that has given to the United States so many excellent educators and men of affairs. Doctor Noble was one of five sons and the homestead was near the foot of the Adirondacks, on rolling hills cut with small brooks teeming with fish and a young paradise for the small boys of the clan Noble. The *New York Tribune* was a daily and Sunday visitor to the home, and though the interior of the small home was simple though sturdy there was a surprising number of well-chosen books and a father and mother who knew how to direct the tastes of small boys to good literature. Throughout his life, this love of history and of classic literature so engendered remained with William Lincoln Noble.

His early education was the "district school." His ambition aroused there was fostered by his truly remarkable mother and later came preparation for College at Canton Academy and later St. Lawrence University. His college was interrupted by periods of teaching to gain funds but in 1885 he got his sheepskin, and almost half a century later,—in 1927 to be exact—his Alma Mater gave him an honorary LL.D. for his work in medical education!

An older brother, Dr. J. B. Noble, had already begun to study medicine at Rush, and so as soon as he had his degree from St. Lawrence "U," William Lincoln Noble followed him to Chicago.

In 1897 Doctor Noble joined the staff of the West Side hospital, and he became both an officer and a director and held these positions until shortly before his death. In 1916 he was elected president of the Illinois State Medical Society, and in that same year was appointed by ex-Governor Frank O. Lowden as a member of a committee drafting a new medical practice act—an administrative code still in use and found most admirable by all of ethical medicine—and further Doctor Noble served also on the first examining board for the licensing of physicians. He

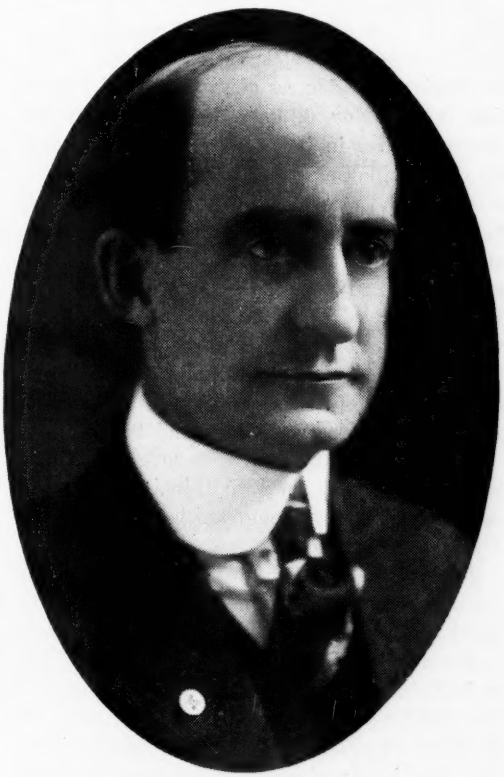
was formerly member Advisory Commission, Illinois Department of Registration and Education. In 1921 he was elected trustee of the University of Illinois continuing in that office through 1933 and for eight years was president of the board. He was largely responsible (in conjunction with Gov. Len Small) for greater appropriations for the university and the initiation of an extensive building program, especially that pertaining to the west campus. A student and a disciple of the Harvard Housing plan, Doctor Noble labored for better living conditions for students and with the support of other members of the board pushed to success, the erection of several sadly needed new dormitories. Deeply interested in the educational side of college life, he was also a firm adherent of the humanities or liberal arts as opposed to trade schools in the curricula of the undergraduates. The year before the United States entered the World War, Doctor Noble served on a committee to organize the medical draft set-up for the state of Illinois and received a commission before war was declared.

Doctor Noble was a member of the Chicago Medical Society; the Illinois State Medical Society; and affiliate fellow of the American Medical Association. In 1912-14-15 Doctor Noble was a delegate from Illinois to the House of Delegates of the American Medical Association. In 1912 he was a member of the Reference Committee on amendments to the Constitution and By-Laws and in 1915 was a member of the Reference Committee on Rules and Order of Business of the American Medical Association; he was a past-president of the Chicago Ophthalmological Society, and a member of the faculty of the Illinois Post Graduate Medical School. His practice in Chicago commenced in 1888.

THE PASSING OF ELMER BURT COOLLEY

A man who had brightened the staff of Aesculapius over half a continent—from western Idaho to mid-western Illinois—passed away on Tuesday, October 12, and this passing of Elmer Burt Cooley, M. D., was a grevious blow to numerous friends and acquaintances.

True, Doctor Coolley had lived more than man's allotted span to man. Born on an Illinois farm on April 17, 1867, this eminent general practitioner was in his seventy-first year. He was both the grandson as well as the son of a Presbyterian minister. His mother, prior to marriage was Miss Pelina A. Biggs and his father was the Rev. Cyrus P. Coolley serving for 12 years at Newman and for the same period at Fairmount, Ill. Doctor Coolley's early education was at Cherry Grove and later at Newman high school whence he went to the Illinois State University and thence to Rush Medical, from which he was graduated in 1888.



Elmer Burt Coolley, M. D.

He immediately began practice in Newtown, Vermilion Co., Illinois. From 1902 until 1904 with his family he passed in search of health at Mountain Home, Idaho. During his stay in Idaho, Dr. Coolley was not a practicing physician yet he did much for the cause of ethical medicine while sojourning there, and left an impress upon the citizens of the town and the vicinity that has been felt for over thirty years.

Upon his return from Idaho, Doctor Coolley took up residence in Danville, Ill., and lived and practiced there until his death. He had served both as president of the Vermilion County

Medical Society (1901) and, in 1909, of the Aesculapian Society of the Wabash Valley, which is the oldest medical society west of the Alleghenies. In 1917 he was president of Illinois State Medical Society. For many years Doctor Coolley was a member of the staff of Lake View Hospital, in Danville, where he had been a patient since Feb. 24, 1937, and where he passed away.

Dr. Coolley became a member of the Masonic order at Newtown, Ill., later transferring to Olive Branch Lodge of Danville, in March, 1908. He received the degrees of the Lodge of Perfection, AASR, Nov. 2, 1904, and the council and chapter degrees in 1908 and was a charter member of Danville Consistory in 1911. He was honored with the recognition of the 33rd Degree on Sept. 15, 1914. He was elected thrice potent master of Lodge of Perfection in 1908 and 1909; was Sovereign Prince of the Council in 1911 and 1912 and served as commander in chief of Danville Consistory from 1919 through 1922. Doctor Coolley served as chairman of the committee on obituaries of the Grand Lodge of State of Illinois during the years 1931 and 1932.

In 1920 Doctor Coolley, a life long Republican, was a candidate in the 18th Illinois District primary election for Congress, being beaten by Uncle Joe Cannon.

Doctor Coolley delighted in watching light harness racing and became so enthused in this sport that he owned and raced a stable for years.

For a number of years he was president of Illinois Tuberculosis Association and a member of the building committee that planned and constructed Vermilion County Tuberculosis Dispensary and he served as a director until his death. He was a past president of Vermilion County Tuberculosis Association.

He was made a life honorary member of Illinois Medical Society because of his past services as president of the organization and to a state medicine. A similar honor was bestowed on him by Danville Rotary Club.

In 1916, the second year after Danville Rotary Club was founded here, Doctor Coolley was elected its president. He was a member at time of his death and had a good attendance record until illness forced him to give up his active duties. He was known in the club as a man who exemplified Rotary ideals. Club presidents knew, too, that when they wanted someone capable of handling a job on a club program, Doctor Coolley was dependable.

Heads Doctors Club

In 1912 he was elected president of Danville Physicians Club and in 1918 was a delegate to American Medical Association and was the first honorary member ever elected by the Tri-State Medical Society. In 1921 he became city health commissioner and served in this capacity several years. He was a past president of Danville unit of Chicago University Club and a life member of Chicago Press Club and Rush Alumni Association.

Doctor Coolley was married June 11, 1891, to Miss Nellie Fowler, daughter of Wiley and Mary Fowler of Pilot Grove, Vermilion County. Two sons, E. Burt, Jr., now dead, and Marion F., Indianapolis, were born to this union.

Besides his widow and son, a sister, Mrs. W. F. Burres, Urbana, survives, and two cousins, William of Paris, and I. N. Coolley of Brocton.

Requiescat—in Pace.

MERRY CHRISTMAS

In wishing the members of the Illinois State Medical Society a "Merry Christmas" the finest possible yuletide gift that the Editor might send to his fellow-physicians would be the hope that the day in every angle shall be filled with the spirit of "PEACE ON EARTH, GOOD WILL TO MEN."

CONGENITAL HYPERTROPHIC PYLORIC STENOSIS IN INFANCY

Edward J. Donovan, New York (Journal A. M. A., Aug. 21, 1937), states that congenital hypertrophic pyloric stenosis occurs about seven times more often in boys than in girls. In the group reported on there were seventeen girls and 126 boys. Vomiting is always the first symptom and in the majority of the cases begins between the second and the fifth week of life. The tumor, caused by hypertrophy of the circular muscle of the pylorus, is pathognomonic of the condition and may be felt in every case. The Fredet-Rammstedt submucous pyloroplasty is the most satisfactory operation and gives a permanent result, as shown by the follow up of the cases reported. There were no deaths in this group. One death occurred in a group of 100 cases reported in 1932, making a total of one death in the last 243 cases. Preoperative preparation is the greatest factor in bringing the mortality to its present level. The complication most to be dreaded is accidental opening of the duodenum. The change from thick pyloric tumor to thin duodenum is rather abrupt, and great care must be exercised in separating the cut edges of the muscle toward the duodenal end.

TREATMENT OF ULCERATIVE COLITIS WITH ALUMINUM HYDROXIDE AND KAOLIN

In ulcerative colitis these is a raw ulcerating mucous membrane, and thus to obtain the maximal benefit from kaolin and alumium hydroxide James B. Eyerly and Herbert C. Breuhaus, Chicago (*Journal A. M. A.*, July 17, 1937), give it only by rectal retention. First, the colon is cleansed with a pint of warm water. In one hour this is followed by a retention enema consisting of a 3 to 5 ounce (60 to 150 Gm.) mixture of kaolin and aluminum hydroxide in from 3 to 5 ounces (90 to 150 cc.) of warm distilled water. The patient is instructed to retain this as long as there is no discomfort. Usually one retention a day is sufficient, but occasionally two are given. In this manner, larger doses of the mixture can be brought into direct contact with the inflamed mucous membrane without previous admixture with food and digestive juices. The diet must be of high caloric, nonirritating type and contain all vitamins necessary for normal health. Opium in some form is frequently used in the early stages if pain and excessive diarrhea are present. A consistent program carried out intelligently is essential if such cases are to be cured. The treatment of ulcerative colitis by aluminum hydroxide and kaolin mixture is rational. The adsorption of bacteria and their products reduces irritation and decreases the absorption of toxins. The astringent action lessens absorption and the transudate from the inflamed surfaces is diminished. It is not toxic. A neutral reaction in the lumen of the bowel is preserved. No bolus or impaction formation occurs with moderate care.

THE STUTTER-TYPE CHILD: THE SPEECH INDEX OF NEUROTIC BEHAVIOR

According to James Sonnett Greene, New York (*Journal A. M. A.*, July 17, 1937), an analysis of 2,203 patients in 1936 applying for treatment at the Medical-Social Clinic showed that about 50 per cent suffered from dysphemia (stuttering) and that the rest suffered from various forms of voice and articulatory conditions. While, as far as the individual suffered is concerned, the defects of articulation and phonation are equal in importance to stuttering, the complexity of the problem of stuttering speech makes it of far more importance from a therapeutic point of view. The stuttering child is classified in a special group. He is viewed as a nervously agitated organism demonstrating strong excitation and a tendency to quick interruption or inhibition and having a high emotional tone. Because of this peculiar functioning the nervous system, the stutter-type child may demonstrate his hesitating performances not only in speech but in many other forms of psychomotor activity. However, as the neuromuscular coordinations involved in speaking are of a highly complex and delicately balanced nature and since speech is so necessary for normal social adjustment, the involvement of the speech faculty in the stutter-type syndrome makes stuttering in speech a far more serious problem than chronic hesitation in other muscular activities. Stuttering has been viewed at the National Hospital for Speech Disorders primarily as a physical symptom of psychic conflict, with the high emotional energy of the stutterer directed toward a fear which disintegrates his entire personality, and the treatment has been arranged in the form of a composite therapy of a medical, social, psychiatric and psychologic nature, directed toward the tranquilization, organization and adjustment of the personality. As the stutter-type child's difficulty is one of social adjustment, his personality problems are worked out in a group medium, directed toward the integration and organization of his personality, so that he may make adequate adjustment to home, school and juvenile social environments. Since the neurologic conditions inherent in the stutter-type child's neuropathic diathesis are aggravated by tensions arising from parental neuroticism and lack of harmony in the preschool home environment, a parent group has been formed for the mothers to facilitate the making of home adjustments. Under proper guidance, mothers receive an insight into child psychology and the importance of harmony in the home. This has resulted in the removal of many disturbing causal factors.

TULAREMIA, PULMONIC FORM: REPORT OF FOUR RECOVERIES

Malcolm D. Winter, Miles City, Mont.; Brownlow C. Farrand, Jordan, Mont., and Harry J. Herman, Jerseyville, Ill. (*Journal A. M. A.*, July 24, 1937), found only twenty cases reported in the literature in which recovery occurred after tularemic pneumonia. They had the records of three more (one of which was complicated by involvement of the central nervous system) and one complicated by bronchitis with small pleural effusions. This complication has resulted in a fatal outcome in all the previous reports that they have seen. The treatment received by these patients was largely symptomatic with the addition of intravenous injections twice a day of sodium salicylate 1.2 Gm. dissolved in 30 cc. of distilled water. This measure seemed to make the patients less toxic. In case 1, daily spinal drainage was carried out after meningeal symptoms developed until the spinal fluid was clear. This measure the authors feel sure was definitely beneficial. After each tap the patient became mentally much more alert. Dyspnea on exertion and general weakness predominated for some months after recovery and would lead one to believe that a toxic myocarditis was the usual sequela. The authors' experience as to the frequency of clinical pulmonary involvement in ulceroglandular tularemia does not coincide with that of Blackford, as pulmonary complications were not present in any of their cases of the ulceroglandular type, nor was either ulcer or glandular involvement present in any of their pulmonic cases. They do feel that the portal of entry in these cases was most likely through the skin, while handling sheep during lambing season, although it is possible that the patients may have eaten food contaminated by the fingers, the damp wet weather making inhalation of infected material very unlikely. Any atypical pneumonia with a relatively low white blood cell count and slow evolution of lung changes should cause one to suspect tularemia. It must also be considered in pleurisy with effusion.

MEDICAL ECONOMICS

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John R. Neal, M. D.
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W. M. Hartman, M. D.

Edited by the Committee on Medical Economics
of the
Illinois State Medical Society
E. S. Hamilton, M. D., Chairman
Kankakee, Illinois

R. K. Packard, M. D.
Ralph Peairs, M. D.
C. B. Reed, M. D.
C. S. Skaggs, M. D.
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Address all letters and communications to the Chairman.

The Chairman of this Committee wishes to thank the other members of the same, particularly State Secretary Dr. Camp; and Chairman of the Legislative Committee Dr. Neal, for the excellent manner in which they conducted the Column during the absence of the Chairman. In fact, we believe the material in the Column was the best last month for the past year.

So much of economic importance in medical circles has appeared in the past two months, it is difficult to know where to start in discussing the same. Probably the most important is the flank attack on organized medicine at Washington, where a Health Insurance Plan for all Federal employees has been organized exactly according to the plan reported at the last meeting of the House of Delegates in Atlantic City last June. At that time it did not receive much attention, due to the fact that many could not believe that the government would subsidize such a movement. However, the meagre details of the plan so far available to the medical profession at large show that the proposed plan is receiving governmnetal aid, both directly and indirectly. The latter method is by medical men from other governmental agencies being transferred to the newly organized group to act in administrative and executive capacities. This in itself should be sufficient proof that the plan has the approval of the reformers. Including as it does, both hospitalization and complete medical care at a price of $2.50 per month, it certainly is practically state medicine under another guise. It could not have been organized in Washington by men in government service without the official there being acquainted therewith and giving tacit approval. Now it is reported by sources usually accurate that the plan is to be expanded to ten or more cities over the United States where there are large numbers of government employees. If this does not appear to be propaganda and missionary work for a more complete and extensive plan for the rest of the country, then we are at a loss for a plausible explanation.

Naturally this has stirred up considerable discussion, both in and out of the medical profession. A group of 430 physicians have approved the plan and made additional suggestions, thereby receiving a great amount of newspaper publicity, as well as the disapproval of organized medicine. There seems to be a definite desire on the part of the press to publicize these men, many of whom are men in their last years of medical practice, who both live and look in the past and with a smug complacency forget the days before they held such exalted positions that they did not need to worry about their future. Many of them are the heads of Medical Schools or associated with Clinics, so that they are removed from the routine care of poor people and know little or nothing about the actual practice of medicine in the home, either city or country.

Possibly the American Medical Association, through its officers, has been dilatory in acquainting the rank and file of the medical profession with the dangers threatening them. Of course, anyone really interested in this subject who has followed the proceedings of the A. M. A. and read the articles in the J. A. M. A. or the ILLINOIS MEDICAL JOURNAL knows what is being proposed at Washington. The defeatists, who say nothing can be done, and the selfish, who insist that it will never affect them in their lifetime, are hopeless at all times. We need now as never before real leadership, and it is to be hoped that the A. M. A. will furnish the same. Even a special meeting of the House of Delegates should be considered to discuss the proper method of opposing this plan. The cost of such a meeting is of no consequence when the gravity of the matter is considered. It seems difficult to believe that the Trustees of the

A. M. A. are willing to assume all the responsibility in the matter.

Dr. A. J. Cronin of England has recently published a book called "The Citadel," which is the story of the first years of a young physician in England and his experiences as a contract physician, a government doctor, and lastly as a physician in private practice. It is most interesting and well worth the time of any medical man. It portrays most excellently the difficulties of a young physician in establishing a practice and gives the laity an inside picture of the troubles of a doctor. Incidentally, it arraigns contract practice severely and, while it is not unkind to the medical profession, it shows that many factors other than ability and industry make for success, as the world gauges success. Buy the book, read it, and pass it on to influential men in your community.

This month we are fortunate in having articles in this column from the pens of both Dr. I. H. Neece, Chairman of the special committee appointed from the Council to assist in the fight on syphilis, and Dr. C. S. Skaggs, Past President of the Illinois State Medical Society. Both are well worth reading, and we hope every member of the State Society will do so.

E. S. Hamilton,
Chairman of Commitee.

WHY DON'T WE SOLVE OUR PROBLEMS?

Do I know why?

Answer: I do as far as I am personally concerned. It is because the rest of the people won't agree to do as I want them to do. The rest of you out there are of about the same opinion. We have all come to the place where we believe that we know about as much as the other fellow. The fact is, too many of us know too much to have confidence in the other fellow. There are many good reasons why we do not trust each other. Then it would seem reasonably fair to say that the reason we do not solve our problems is, we cannot agree on any program and abide by its principles because we have lost confidence in each other.

Can confidence be restored? Not until we can trust each other and be worthy to be trusted. Can this tangle be untangled? No one would want to say no, nor would anyone have the right to say this cannot be accomplished, for this would be equivalent to saying that our situation is a hopeless one. I have read and heard this quotation: "I, even I, forgive your transgression for my own sake." Can man ever understand the full meaning of these few words?

What has happened to mankind? Another question that each individual has a personal answer for. This personal answer having the same living theme. That is, if one looks into himself deeply, there will be found an excuse for the past mistakes I have made in society and a blame for you.

We refuse to believe in fundamental principles and play a make-believe game. We pretend to believe in false standards and defend them in words when we are conscious that we are not supporting the principles that would solve our problems. In the past few years many a man and woman have made themselves prominent in playing a make-believe part. That the greater portion of people do accept these false standards is proven by the evidence obtained through the channels of modern advertisement.

Turn on your radio for a few moments and hear what you can buy for a dollar down and then what will be given to you absolutely free if you make this purchase, pay a dollar and sign your name. Look at the billboards, the advertising pages in the papers and magazines. These pay profits or they wouldn't be heard or seen, for they cost money. The make-believe game has stolen the crowds and the game of truth has no following. If the truth has no opportunity to be presented, there is little chance for the people to know it and, if presented, the glamour of the make-believe is so beautiful and promising to personal gain that the truth has no appeal.

Some students of the past tell us that man made his appearance upon this earth some five million years before you and I came here. This leaves no doubt about the past that man has been trying to create a social order for some time. There are records of some seven different civilizations which have come and gone, except the one we now have, and there are some who are about ready to file the record of this one among the archives of the past. How many civilizations may have existed before man felt that his acts were worthy of recording is a difficult question to answer and, if answered, would only leave a blank page.

This is our day and our civilization, are we

going to keep it, and bring it to a higher and higher standard? Or are we going to wreck it upon the racks of personal selfishness? To me there is no greater personal selfishness than that which demands that every individual and group of individuals be controlled and subservient to the small group who style themselves the government.

To me, the government means the people and those who administer the affairs of the people are their servants. A nation can only grow as its people grow and have the power of government invested in them. No man or small group of men have ever grown strong enough to think for the people; he or they must do as the people think.

Our present civilization is drifting toward the place where we are to be told by the few self-styled superminds that the masses are not capable of thinking for themselves and must be submissive to the small group. That each of us must wait to be told what to do, how to do it, and when to do it. Whatever the reason for doing it is no concern of ours, and the only personal rights that we have are the rights to obey orders.

If a civilization or nation can remain well nourished upon food of this character it will have done far better than any civilization or nation of the past has ever done. Such conditions produce mental poverty of those who govern and the governed, and poverty of any kind or character has never resulted in the best, but instead has only left the residue of the worst.

In the past our nation preserved the best in the individual. We have reversed this program and we are destroying the best and preserving the worst. We are saving the unfit at the expense of the fit. We have an emotional craze for the unfit, the down-and-out and the criminal, and the cost of it all must be borne by those who have an urge to make a better world.

C. S. Skaggs.

THE PROGRAM OF VENEREAL DISEASE CONTROL

In Retrospect: Until 1918 no serious attempt had ever been made to control venereal diseases. The campaign which began in that year, appealed to the patriotic sense of the public, which was then very strong.

Money was appropriated by Congress under the Chamberlain-Kahn act, and allotted to states in proportion to population, provided the states put up a like amount. The work was carried on fairly successfully for three years, when Congress, sensing the public demand for retrenchment, decided the venereal disease campaign was a war measure and failed to re-appropriate. The states lost interest and the public gradually recovered an embarrassment at the mention of gonorrhea and syphilis. Nothing was left of the program in the State of Illinois but a few scattered clinics.

The first attempt failed because it was not built on a solid foundation so the present fight will be lost, if steps are not taken to strengthen its groundwork, and enlist the entire medical profession in the program of control.

In the first campaign, too much stress was placed on the moral aspect of venereal diseases. The public will accept health regulations, but they reserve the right to regulate their own morals. The mere fact that it is often venereal in its origin should not hamper its control. A new trend of public opinion can be observed. This has been brought about by the spreading of knowledge relative to the cause, effects, prevention and treatment, all of which must be closely bound together in any program for the control of the disease.

The Present Campaign: The present movement is purely and simply a health campaign. Epidemiology is its most important feature. No public health work can succeed without the support of public opinion. The educational program of the present campaign has been carried on very vigorously. The Newspapers have been liberal with publicity so that few days have passed during the year of 1937 when no mention of the syphilis fight has been made. Lectures have been and are being given to audiences of lay persons in all walks of life. Special efforts are being made to reach those in the lower income groups, who by reason of their small earnings have not had the educational advantages which others have enjoyed. Motion picture films and lantern slides are used to illustrate these lectures. Pamphlets covering the various phases of venereal diseases programs are being distributed to the public. The plan for "refresher courses" is in the making, to which physicians will be invited

with a view to disseminating information concerning the up-to-date method of treatment of venereal diseases, and in stimulating the interest of the medical profession in obtaining information concerning sources of infection and contacts. Realizing that the publicity, together with the eduational measures, would greatly increase the demand for treatment, the State Department of Public Health has made preparations to take care of this demand by increasing the number of clinics for the indigent, and by furnishing free drugs to all physicians for treatment of all syphilitics. A good many physicians seem to be unaware that anti-syphilitic drugs, to meet all of the legitimate needs, may be had entirely free from the State Department of Public Health. There are no strings whatsoever attached to distribution of these drugs. The only requirement is, that the physician shows evidence of a need. This means merely that all cases must be reported and that each patient for whom drugs are requested must be identified by name, number or initial with each request for drugs. The financial ability of patient makes no difference whatsoever. The drugs are free for treatment of ALL syphilitic patients. Free distribution of these drugs has been undertaken by the State Department of Pubic Health, in order to make adequate, efficient treatment available to every infected patient in Illinois. The Director of Public Health reports that more than 18,000 new cases of the disease have been reported in the State to date, this year, evidence of the magnitude and seriousness of the problem.

Another service provided free by the State Department of Public Health, as a weapon against syphilis, is the laboratory testing of blood specimens, for detection of syphilis. It became necessary for the State Department of Public Health to increase the capacity of its laboratories to accommodate the great demand for blood tests. It had been the rule in the past, to run both a Wassermann and Kahn test, on all samples submitted. A Committee, including members of State Public Health Laboratories, and others, advised that the capacity of existing laboratories could be greatly increased by adopting the Kahn test as a standard and using the Wassermann as a check on all blood specimens resulting in a positive Kahn. This method has been adopted by the Committee of Laboratory Standards in the Department of Public Health.

To secure the highest possible efficiency in Laboratories, Dr. Reuben L. Kahn of the University of Michigan, Ann Arbor, Mich., the originator of the Kahn test, has been secured as Consultant and is now supervising the laboratory technique. His actual participation in the work assures accuracy, and will serve to create confidence in laboratory reports. The Division of Laboratories of the State Department of Public Health hopes to be able to furnish a standard Kahn antigen to all laboratories certified by the Department of Public Health. With a standard antigen and approved technique, uniform reports should be returned from all laboratories. This will result in much satisfaction to practitioners and physicians.

The Laboratory Standards Committee, augmented by the addition of Dr. R. Kahn, Dr. Harry Eagle, Consultant Bacteriologist of the United Staes Public Health Service, and Doctors Elliott and Applewhite of the United States Public Health Service, after much deliberation advised that the old method of reporting positive reactions as one plus, two plus, three plus and four plus, be abolished, using instead the clarified nomenclature of POSITIVE, DOUBTFUL and NEGATIVE. This recommendation was adopted by the State Department of Public Health.

In the future, when a physician receives a positive report on a Kahn Test, he will know that a Wassermann test on the same specimen has likewise resulted in a positive re-action. A "doubtful" will mean that the result is inconclusive and that another specimen should be submitted.

A "negative" report means that no evidence of syphilis is shown by the Kahn test. A negative result, however, does not exclude syphilis in an earlier and treated case, and is not an indication that sufficient treatment has been given.

To elucidate this method of reporting, the following explanation is to appear on the back of the report form.

EXPLANATION OF LABORATORY REPORT

Positive—Both a Kahn and a Wassermann Test have been performed on this specimen. Both are positive, or one is positive and the other strongly suggestive. Unless the clinical diagnosis or history definitely indicate syphilis, no patient should be treated for syphilis on the basis of a single specimen. *Confirm this*

result by a repeat specimen if there is any doubt as to clinical diagnosis.

Doubtful—The two tests used give an inconclusive result. This may or may not be due to the presence of syphilitic infection. This result calls for a careful clinical check-up and a repeat specimen.

Negative—The Kahn Test on this specimen gives no serologic evidence of syphilis. However, a negative result does not necessarily exclude the presence of syphilis, and in a patient under treatment, it does not necessarily imply cure.

I. H. NEECE.

Correspondence

Benton, Ill.

MYASTHENIA GRAVIS

A SUPPLEMENTAL REPORT OF A CASE

To the Editor:

In the April issue of the ILLINOIS MEDICAL JOURNAL, 1936, I reported a case of myasthenia gravis which had its incipiency many months prior to the report. Having never come in contact with a case of myasthenia gravis prior to this one, and the patient being a physician, Dr. J. O. Hart, and a friend of my home town, and having learned of the long, protracted course of the disease, I set about to learn more about its nature, course, treatment, etc.

I had reprints on myasthenia gravis from various sources in this country and foreign countries; and judging from the case reports which were collected it appeared to be a disease which runs a course of several years. Some of the cases reported confined the patients in bed, requiring a constant attendant from five to seven years. It appeared from the reports that the usual treatment did little, if anything, to shorten the course of the disease.

This patient had taken glycocoll to the amount of fourteen pounds with no appreciable improvement. In some of the reports from research centers, Mayo's and others, it appeared that a bacterial cause had been attributed to myasthenia gravis, and it was thought that some cases had as the primary cause an infection.

Having used Edwenil for more than two years, in endotoxic infections with the most marked good results, I resolved to give Edwenil a tryout in myasthenia gravis. Accordingly Dr. Hart has received 2cc's daily for more than twelve months. For the first two or three days the secretion in the nose and throat was increased; then followed a rapid decline in secretions, and soon the patient was quite comfortable in that respect, and was no longer forced to constantly use Kleenex or cloth on the fingers to be removing accumulated secretions from the mouth, pharynx, nose and throat. The eyes ceased overflowing, the congestion of the conjunctiva subsided, and the condition of the patient was rendered more comfortable in most every way.

Since beginning the use of Edwenil the patient has gained forty pounds in weight, his strength has increased so much as to enable him to be up for hours at a time, and he has for the past month or two been able to make short calls upon his neighbors.

It might be mentioned that if the Edwenil is omitted for a day or two, the eyes and throat become congested and the secretions increased, however, a return to the daily dose of Edwenil clears them up.

So far as the writer knows the use of Edwenil in the treatment of myasthenia gravis is an extraordinary treatment, and the results in this case seem to be confirmatory of the infection theory, at least in this individual case.

If other physicians who treat myasthenia gravis should find that Edwenil gives the comfort, satisfaction and other improvements that have come to this patient by its use, I feel that it would be timely to make the results known to the profession through the columns of the ILLINOIS MEDICAL JOURNAL.

W. H. SMITH, M. D.

AMENDMENT TO TYPHOID RULES

Amending "MANUAL AND OUTLINE OF PROCEDURE FOR HEALTH OFFICERS FOR THE CONTROL OF COMMUNICABLE DISEASES", Revised and in force on and after April 30, 1935, throughout Illinois, as follows:

Page 125, paragraph 2 at top of page, omit the first sentence, "IMMUNIZED INMATES OF THE PREMISES, EXCEPT FOOD HANDLERS, MAY GO ABOUT THEIR USUAL BUSINESS, PROVIDED THEY DO NOT COME IN CONTACT WITH THE PATIENT," and add instead the following: "IMMUNIZED INMATES OF THE PREMISES, EXCEPT FOOD HANDLERS, PROVIDED THEY HAVE SUBMITTED TWO SPECIMENS OF FECES AND URINE AT INTER-

VALS OF TWENTY-FOUR HOURS TO THE LABORATORIES OF THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH MAY GO ABOUT THEIR USUAL BUSINESS PROVIDED THEY DO NOT COME IN CONTACT WITH THE PATIENT," so that the paragraph in which this corrected sentence appears will read as follows:

"Immunized inmates of the premises, except food handlers, provided they have submitted two specimens of feces and urine at intervals of twenty-four hours to the laboratories of the Illinois Department of Public Health may go about their usual business provided they do not come in contact with the patient.

"All immunized contacts in the home, who are engaged in the production or handling of milk, cream, milk products, and other foods likely to be consumed raw, and who have submitted two successive negative specimens of feces and urine taken not earlier than four days apart, specimens to be collected from the second or third bowel movement after a cathartic has been given, with permission of the local health authority, may be permitted to leave quarantine premises to live at some other address so that they may resume their usual occupations, provided they do not come in contact with any member of the family under quarantine and do not return to their former place of residence until termination of quarantine."

Above regulations amended and promulgated, October 6, 1937.

A. C. Baxter, M. D.,
Acting Director, Illinois Department,
of Public Health, Springfield.

SCIENTIFIC EXHIBITS

Your committee is now soliciting scientific exhibits for the meeting at Springfield, May 17, 18, 19, 1938. Such exhibits have proven of great interest at the past meetings and have improved in quality from year to year. We want to make the scientific exhibit at Springfield the best so far.

If you have nothing for the scientific exhibit, possibly some organization with which you are associated would have something that might be exhibited in the Hall of Health which is to be open to the public. This public exhibit is to educate the public with respect to the advances that have been made in our knowledge of disease and its prevention; the scientific exhibits to present the results of recent investigations to the profession.

Silver and bronze medals and certificates of merit are made to exhibits of individual investigations based on excellence of presentation and on originality, to exhibits that do not exemplify purely experimental studies on the basis of excellence of presentation.

If you are interested, write for "Application for Space in the Scientific Exhibit", to N. S. Davis, III, M. D., 700 North Michigan Avenue, Chicago.

DOCTORS WISHING TO PRESENT PAPERS AT ANNAL MEETING

The program for the Medical Section of the Illinois State Medical Society is now in the course of preparation. Doctors who wish to present papers should send a title and an abstract before January 1, 1938.

Men living outside of Chicago should communicate with:

Dr. Cecil M. Jack,
Decatur, Illinois.

Men living in Chicago should communicate with:

Dr. Robert W. Keeton,
8 S. Michigan Ave., Chicago, Ill.

PAPERS TO BE PRESENTED BEFORE SECTION ON RADIOLOGY ILLINOIS STATE MEDICAL SOCIETY

The officers of the section on Radiology of the Illinois State Medical Society which meets in Springfield, May 17, 18, and 19, 1938, will welcome speakers who wish to appear on the program of this section.

Any physician desiring to present a paper before this section should write to the secretary, Dr. Harry B. Magee, 600 Alliance Life Building, Peoria, Illinois, announcing the title of the paper and submitting a short abstract of the subject matter to be discussed.

PHYSICIANS WHO WISH TO PRESENT PAPERS AT ANNUAL MEETING OF EYE, EAR, NOSE AND THROAT SECTION

The officers of The Eye, Ear, Nose and Throat Section of The Illinois State Medical Society desire to announce that they are preparing the Section Program and completing other arrangements for the Meeting, which is to be held at Springfield, Illinois, May 17th and 18th, 1938.

You are urged to communicate with the Secretary at once with reference to any contribution from you for a place on the Program, submitting the title and synopsis of the paper for consideration. Each speaker will be given 20 minutes to present his suggestions and a subsequent discussion limited to 3 minutes each.

SAMUEL J. MEYER, M. D.,
Secretary of Section.
58 East Washington St., Chicago, Ill.

EDUCATIONAL COMMITTEE

Report for November, 1937

PRESS SERVICE:

The Educational Committee has increased its service to the newspapers of Illinois and their response is most encouraging. Headlines given the material are attractive and important space in many of the newspapers is devoted to these articles dealing with medical and public health questions.

784 copies of this material were released to Illinois newspapers.

2,388 copies were sent to libraries, home advisers, health chairmen, teachers and WPA leaders as well as to officers of county medical societies.

Articles were written on the following subjects:

Measles
The Blood Count
Going a Hunting
Are Winter Epidemics Necessary
Medical Service in the United States
You and Your Automobile
Cancer Mortality High
Running Ears
Eyes and Eye Glasses
Eye Examinations

In addition to the above type of service, announcements were released about county medical meetings as follows:

153 newspaper releases about meetings of Effingham, Mason, Henry, the Tri-County and the Chicago Medical Society.

RADIO:

19 radio programs were given over stations WBBM, WGN, WJJD and WAAF.

500 copies of the radio schedules were sent to interested individuals in the state.

SPEAKERS BUREAU:

46 speaking appointments were arranged for lay groups. The Committee is prepared to fill all requests which come in, and county medical societies are urged to let their local lay groups know of this service. Health programs are popular and the subjects which have to do with the relationship of medicine to the public are particularly appropriate at this time. Men's clubs are especially interested in this type of program. Many excellent speakers are available.

ASSISTANCE TO COUNTY SOCIETIES:

Radio talks were furnished Vermilion and McLean County Medical Societies.

Assistance was given in promoting the public meetings sponsored by the Chicago Medical Society.

514 invitations were prepared and mailed concerning meetings of Henry, Effingham and Mason County Medical Societies.

PROGRAMS ON OBSTETRICS AND PEDIATRICS:

28 speakers were scheduled for talks in November.

371 releases announcing the meetings were sent to newspapers.

1,443 invitations were mimeographed and sent to doctors.

Programs have been arranged for La Salle, Coles-Cumberland, Lee-Whiteside, Hancock, Jefferson-Hamilton-Wayne, Lawrence-Crawford-Jasper County Medical Societies.

Other series of programs are now being planned for several of the Southern counties and Iroquois County Medical Society.

MISCELLANEOUS:

Moving picture films have been secured for a number of groups.

Arrangements have been made for Exhibit Material for Y.M.C.A.s.

Information concerning the work of the Committee has been supplied a number of other state medical societies.

SCIENTIFIC SERVICE:

22 programs were arranged for County Medical Societies.

The Scientific Service Committee is prepared to assist any county society in planning suitable programs. An excellent list of speakers is on file in the office of the committee, and speakers are available in all sections of the state.

WRITTEN EXAMINATION

The American Board of Internal Medicine will hold its next written examination on Monday, February 14, 1938, in various centers of the United States and Canada.

The examination will consist of two sessions of three hours each, with the morning session held at 9:00 o'clock a. m., and the afternoon session held at 2:00 o'clock p. m.

The candidates who are successful in this written

examination will be eligible to take the practical examination, which will be held in San Francisco the Friday and Saturday prior to the opening of the Annual Session of the American Medical Association in June, 1938.

The final date for filing applications for this written examination is January 15, 1938, and all applications should be in the office of the chairman before that date.

For further particulars and application blanks please address

Dr. Walter L. Bierring, M.D., Chairman,
American Board of Internal Medicine,
Suite 1210, 406 Sixth Avenue,
Des Moines, Iowa.

ANNUAL MEETING OF THE MISSISSIPPI VALLEY MEDICAL SOCIETY

The fourth annual meeting of the Mississippi Valley Medical Society will be held at the Hannibal-LaGrange College, Hannibal, Mo., Sept. 28, 29, 30, 1938. The following officers have been elected for 1938:

President—Charles S. Skaggs, East St. Louis, Ill.

President-Elect—M. Pinson Neal, Columbia, Mo.

First Vice President—Arthur H. Bitter, Quincy, Ill.

Second Vice President—W. F. Francka, Hannibal, Mo.

Third Vice President—Edward M. Myers, Boone, Iowa.

Secretary-Treasurer (re-elected)—Harold Swanberg, Quincy, Ill.

The members of the recently elected Board of Directors are:

For Illinois: G. M. Cline, Bloomington; E. P. Coleman, Canton; E. C. Kelly, Peoria; C. J. White, Chicago; A. E. Walters, Springfield; F. Garm Norbury, Jacksonville.

For Missouri: H. B. Goodrich, Hannibal; E. S. Smith, Kirksville; Ernest Sachs, St. Louis.

For Iowa: W. A. Sternberg, Mt. Pleasant.

MISSISSIPPI VALLEY MEDICAL SOCIETY ESSAY AWARD

The Mississippi Valley Medical Society offers a cash prize of $100.00, a gold medal and a certificate of award for the best unpublished essay on a subject of interest and practical value to the general practitioner of medicine. Entrants must be ethical licensed physicians, residents of the United States and graduates of approved medical schools. The winner will be invited to present his contribution before the next annual meeting of the Mississippi Valley Medical Society at Hannibal, Mo. (September 28, 29, 30, 1938), the Society reserving the exclusive right to first publish the essay in its official publication—the Radiologic Review and Mississippi Valley Medical Journal. All contributions shall not exceed 5000 words, be typewrtten in English in manuscript form, submitted in five copies, and must be received not later than May 15, 1938. Further details may be secured from

Harold Swanberg, M. D., Secretary,
Mississippi Valley Medical Society,
209-224 W. C. U. Building, Quincy, Ill.

A SYMPOSIUM ON SYPHILIS

The section on Medical Sciences of the American Association for the Advancement of Science will sponsor a symposium on syphilis at the next Annual Meeting to be held in Indianapolis, Ind. December 27-January 1, 1938.

MAKE HOTEL RESERVATIONS FOR 1938 AMERICAN MEDICAL ASSOCIATION ANNUAL SESSION

The Board of Trustees of the American Medical Association has appointed Doctor Howard Morrow of San Francisco as General Chairman of the Local Committee on Arrangements. Among other appointments of local sub-committees, Doctor Morrow has appointed Doctor F. C. Warnshuis, Chairman of the local committee on Hotels.

Fellows are requested to send in their requests for hotel accommodations to Doctor F. C. Warnshuis, Suite 2004, 450 Sutter Street, San Francisco, California, giving names of members in party, type of accommodations desired, time of arrival and departure.

Assignment of accommodations and their confirmation will be made for each reservation request. Do not write directly to any hotel as *all* reservations will be cleared through the Hotel Committee.

Banquet Rooms and Special Dinners reservations must be made through the Hotel Committee. The same rule applies to special boards and allied organizational groups.

San Francisco affords first-class hotels capable of providing accommodations for 15,000 fellows and members of their families. However, early reservations are requested to avoid confusion and to insure individual choice. A pleasing surprise awaits every fellow in the hotel accommodations of the Golden Gate City.

Those planning to visit San Diego, Los Angeles, Santa Barbara, Del Monte, Yosemite, or other California cities are urged to write in advance for hotel reservations in these cities. Following the American Medical Association Annual Session, the Rotary, Kiwanis, and Shriners hold their annual sessions in California. It is quite probable that many of the members of these organizations will visit points of interest before their conventions, thereby creating heavy demands on local hotels throughout the State.

THE WOMEN'S FIELD ARMY PROGRAM AND THE PHYSICIAN

After a year's experience in nearly forty states the Women's Field Army Against Cancer of the American Society for the Control of Cancer is extending its work

into practically every state. This program is unique in the history of health education movements in that *from the beginning* the medical profession has been asked to direct the work. In every state lay leaders have been appointed only with the approval of the medical organizations.

In this Women's Field Army plan lay speakers are discouraged from speaking on the scientific aspects of cancer. This phase of the program has been placed in the hands of physicians in the belief that a physician is the properly qualified person to discuss this subject before public groups. The activities of lay workers are restricted to organization and other problems. It is thus seen that the program is being developed along lines most favorable to the physician. By this same token there is placed on the physician the responsibility of making the program as effective as possible.

The program is built around the fact that early cancer is curable, and to detect it in early stages the periodic examination of the apparently well individual must be employed. As a result of the public discussion of this subject thousands of persons for the first time have sought examination by their physicians to determine the presence or absence of cancer. As the program develops thousands more will ask for this same service. This makes it essential that physicians be on the lookout for precancerous lesions as well as signs of early cancer, and conduct these examinations in as thorough and painstaking a manner as possible. A patient requesting such an examination is entitled to the best service the physician can give, regardless of objective absence of disease. After obvious signs of cancer appear it is often too late to render a curative service; therefore no physician should make light of any patient's request for an examination.

No physician should hesitate to avail himself of facilities for obtaining the answer to the patient's problem when they are not at his immediate disposal. The diagosis and treatment of cancer is a group problem, and no physician has the ability alone to cope adequately with all forms of this disease.

One criticism emanating from medical sources is that a lay cancer educational program will create a cancerphobia in the public mind. In answer it should be remembered that an intelligent request for information about cancer is not cancerphobia; also, that cancerphobia never metastasizes and never kills.

Another criticism coming from a few laymen is that this emphasis on periodic examinations is but a dodge on the part of the medical profession to increase its income. Such criticism should not be taken seriously, and should be answered by pointing out that only by early diagnosis and treatment can the cancer patient be saved from an untimely death. If the profession wanted to profit from this situation it could do so in far greater measure by neglecting the early stages of cancer knowing that the care of the incurable patient would be far more prolonged and remunerative.

With this opportunity for constructive participation in a nation-wide health education movement the physicians of Illinois should see to it that no patient is denied the fullest measure of service within the power of physicians to render. Only by such a service can they expect to retain direction of this program.

HOFFMANN-LA ROCHE TAKES OVER NEW INDUSTRY

Hoffmann-La Roche, Inc., announce the formation of The Roche-Organon Company, a new company which will undertake the manufacture and distribution of the world-famous Organon hormone products in America. Plans were recently completed in The Hague for this collaboration of the Organon Laboratories of Holland with Hoffmann-La Roche, Inc., of Nutley, New Jersey, which will make hormonal therapy available to American physicians on a hitherto unattainable scale.

Many Organon products are well-known to American physicians. A few of the widely prescribed preparations which will not be manufactured and distributed by Roche-Organon are the estrogenic hormones, Di-Menformon and Progesterone; the synthetic male sex hormone, Neo-Hombreol; the gonadotropic hormone of pregnancy urine, Pregnyl; the vital hormone of the adrenal cortex, Cortin; and antianemic liver and stomach preparations of unusually high potency and purity for the treatment of pernicious anemia. Throughout Europe the Organon company is recognized as a leader in endocrine research and in the production of hormones. It includes in its staff several internationally famous endocrinologists. The scientific advisor, Professor Laqueur, who has been in the forefront of endocrine research, is also Director of the Pharmacological Laboratory of the University of Amsterdam and the president of the university.

UNITED STATES CIVIL SERVICE EXAMINATIONS

PRINCIPAL SPECIALIST IN MATERNAL AND CHILD HEALTH, $5,600 A YEAR

SENIOR SPECIALIST IN MATERNAL AND CHILD HEALTH, $4,600 A YEAR

SPECIALIST IN MATERNAL AND CHILD HEALTH, $3,800 A YEAR

ASSOCIATE IN MATERNAL AND CHILD HEALTH, $3,200 A YEAR

Optional Branches

1. Pediatrics.
2. Obstetrics.
3. Orthopedics.
4. General (Maternal and Child Health).
5. Psychiatry for children.

Children's Bureau, Department of Labor

Applications must be on file with the United States Civil Service Commission at Washington, D. C., not later than the following dates—

(a) *December* 28, 1937, if received from States other than those named in (b), below.

(b) *December* 31, 1937, if received from the following States: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.

The United States Civil Service Commission an-

nounces open competitive examinations for the positions named above. Vacancies in these positions in Washington, D. C., and in the field, and in positions requiring similar qualifications, will be filled from these examinations, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion. The salaries named above are subject to a deduction of 3½ per cent toward a retirement annuity.

Employment lists.—For each of the above-named optional branches, employment lists will be established, based upon the experience shown by applicants, as follows:

For positions in (a) *Administration*—Principal Specialist in Maternal and Child Health, Senior Specialist in Maternal and Child Health, and Specialist in Maternal and Child Health.

For positions in (b) *Research*—Senior Specialist in Maternal and Child Health, Specialist in Maternal and Child Health, and Associate in Maternal and Child Health.

Applicants should indicate in their applications the optional branch or branches chosen and the lowest salary they are willing to accept.

ASSOCIATE BIOCHEMIST (SYPHILIS RESEARCH), $3,200 A YEAR

U. S. Public Health Service, Treasury Department

Applications must be on file with the United States Civil Service Commission at Washington, D. C., not later than the following dates—

(a) *December* 28, 1937, if received from States other than those named in (b), below.

(b) *December* 31, 1937, if received from the following States: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.

The United States Civil Service Commission announces an open competitive examination for the position named above. Vacancies in this position in Washington, D. C., and in the field, and in positions requiring similar qualifications will be filed from this examination, unless it is found in the interest of the service to fill any vacancy by reinstatement, transfer, or promotion. The salary named above is subject to a deduction of 3½ per cent toward a retirement annuity.

Present vacancy.—A vacancy exists in the Syphilis Research Center, Johns Hopkins Hospital, Baltimore, Md.

Duties.—To conduct investigative or research work in antibody chemistry, pollen chemistry, the chemistry of the arsphenamines, or related problems.

Basis of ratings.—Competitors will not be required to report for examination at any place, but will be rated on the extent and quality of their education and experience which are relevant to the duties of the position, on a scale of 100, such ratings being based upon competitors' sworn statements in their applications and upon corroborative evidence.

Statements concerning experience will be corroborated by the Commission; exaggeration or misstatement will be cause for disqualification.

Application forms.—The necessary forms may be obtained from the *Secretary, Board of United States Civil Service Examiners, at any first-class post office,* from the United States Civil Service Commission, Washington, D. C., or from the *United States Civil Service district office* at any of the cities given below (the title of the examination desired should be stated):

Atlanta, Ga., New Post Office Building.
Boston, Mass., Post Office and Courthouse Building.
Chicago, Ill., New Post Office Building.
Cincinnati, Ohio, Post Office Building.
Denver, Colo., Post Office Building.
New Orleans, La., Customhouse.
New York, N. Y., Federal Building, Christopher Street.
Philadelphia, Pa., Old Post Office Building.
Seattle, Wash., Federal Office Building.
St. Louis, Mo., New Federal Building.
St. Paul, Minn., New Post Office Building.
San Francisco, Calif., Federal Office Building.
Honolulu, T. H., Federal Building.
Balboa Heights, Canal Zone, *Secretary, United States Civil Service Board.*
San Juan, P. R., *Chairman, Puerto Rican Civil Service Commission.*

The exact title of the examination, as given at the head of this announcement, should be stated in the application form.

EXAMINATION FOR ENTRANCE INTO THE MEDICAL CORPS OF THE NAVY

An examination of candidates for appointment as Lieutenant (junior grade), in the Medical Corps of the Navy, will be held at all Naval Hospitals in the United States and at the Naval Medical School, Washington, D. C., Beginning May 16, 1938.

Candidates for admission must be between the ages of 21 and 32 years at time of appointment, graduates of Class "A" medical schools, and have completed an internship of one year in a hospital accredited for interns by the American Medical Association and the American College of Surgeons.

Those who are interested should write the Surgeon General, U. S. Navy, Bureau of Medicine and Surgery, Navy Department, Washington, D. C., for further information in regard to the examination and the procedure to follow for them to appear before one of the Examining Boards.

REMOVING ADHESIVE PLASTER

For the painless removal of adhesive plaster, it should be thoroughly moistened with commercial carbon tetrachloride, which costs about 25 cents a pint. For use on sensitive patients who might object to its odor, it can readily be perfumed (neo-gardenia is good), and if its nature is to be kept secret it can be colored. A commercial preparation so treated sells for $1.33 a pint.—Louis W. Schwindt, M. D., in *J. A. C. Proct.*, May, 1936.

CONTROL OF SYPHILIS: CLINICAL LECTURE AT ATLANTIC CITY SESSION

Thomas Parran, Washington, D. C. (*Journal A. M. A.*, July 17, 1937), believes that in a country as diverse as this, no one stock plan of syphilis control is applicable. In each state and in each city the problem needs to be studied and a plan of action developed to meet particular local needs. Certain basic principles, however, have general application. These principles may be summarized briefly as follows: 1. There should be a trained public health staff to deal with syphilis in each state and city. 2. Minimal state laws should require reporting of cases, follow up of delinquents, and the finding of sources of infection and contacts. 3. Premarital medical certificates, including serodiagnostic tests, should be a legal requirement. 4. Diagnostic services should be freely available to every physician without charge and should meet minimal state standards of performance. 5. Treatment facilities should be of good quality, with convenient hours and location. Wherever possible the clinic service should be a part of an existing hospital dispensary. Hospital beds should be provided for patients needing bed care. 6. The states should distribute antisyphilitic drugs to physicians for the treatment of all patients. 7. Routine serodiagnostic tests need to be used much more widely. In particular, every pregnancy, every hospital admission, every complete physical examination should include this test. 8. The informative program in modern diagnosis, treatment and control should be prosecuted vigorously among physicians and health officers, especially through the use of trained consultants. 9. The public educational program must be persistent, intensive, and aimed especially at those individuals in the age groups in which syphilis is most frequently acquired. If these principles are applied to meet varying local conditions, no one can doubt that the shadow of syphilis will be lifted from the land. The object of the Public Health Service in fighting syphilis is identical with the historic objective of the medical profession. It is not to make industry more efficient, though it is hoped that it will. It is not to save Americans money, though success will save them very much. It is not to make any one more comfortable and contented, though syphilis causes much discomfort and discontent. It is to make the lives of Americans more healthful and more secure.

ACCIDENTAL DEATHS INCREASE

The National Safety Council recently issued its annual compilation of statistics on accidents giving data for 1936. The report shows that 111,000 persons met accidental deaths in 1936, one death every five minutes. There were 10,730,000 persons injured, with permanent disability in 400,000 cases. The accident death rate was 86.4 per hundred thousand persons, an increase of 10 per cent over the previous year; approximately half this increase was attributed to the excessive heat of 1936, the report pointed out, about five times the usual average number of deaths being credited to that cause. Fatal traffic accidents increased to a new high point of 37,800, but they were exceeded by home accidents, which killed 38,500. Falls killed more persons than any other accidental cause except traffic accidents; 47 per cent of the victims were women. Deaths from occupational accidents reached 18,000 in 1936, as compared with 16,500 in 1935. Fatalities in the classification "public, not motor vehicles," rose 11 per cent from 18,000 in 1935 to 20,000 in 1936. Mishaps in this group covered such occurrences as drownings, poisonings and fire arms accidents not covered by the other three groups and that did not involve a motor vehicle. Children from 5 to 14 years old showed the best record, a death rate of 34.6 per hundred thousand. Younger children had a rate of 76.3, and rates for other age groups were as follows: from 15 to 24, average 56.7; from 25 to 64, average 81.1, and above 65, average 398.1. A comparison of rates for men and women showed that accidents last year killed 110.2 men in every hundred thousand and only 46.1 women. The number of men killed was greater than the number who died of any disease except heart disease. Arizona had the highest accident rate for all types of accidents, 165.5 deaths per hundred thousand persons, and Rhode Island the lowest, 59.3.

THE ROLE OF LACTOBACILLUS ACIDOPHILUS IN THE TREATMENT OF DISORDERS OF THE DIGESTIVE TRACT

W. H. Pipes and W. L. Owen (New Orl. M. and S. J. 89:355, January 1937).

Since the discovery of the L. acidophilus by Moro nearly four decades ago, numerous investigators have shown that this aciduric organism has a favorable effect in the human intestinal tract, that its value is enhanced when lactose is also ingested, that the administration of large numbers of the organism permanently alleviates constipation and diarrhea, and that the L. Bulgaricus can not be implanted in the human intestine.

Milk is the logical carrier and the ideal substrate for the cultivation of L. acidophilus, but the milk used must be free of other bacteria that may interfere with the growth of this organism, and it must not be contaminated by copper. Incorporation of L. acidophilus in tablets, chocolate, and similar media other than milk has not proven successful, but it may be combined with yeast.

MASS ASSAULT CAN MOVE MOUNTAINS

"To abstain from medical activities under present menacing conditions is a wasteful squandering of that valuable asset of good teamwork at the very time when collaboration is absolutely vital. One does not change horses in the middle of the stream. When out in mid-ocean in a storm you do not see anybody shoving off in a rowboat by himself to save passenger money. Present conditions make mass action imperative and mass assaults can move mountains. Few, if any, can deny need for maintenance by the medical profession of the strongest possible organization—strong in numbers, militant in spirit and untiring in its concerted efforts to protect the interests of the medical profession and in so doing the interests of the community."—Charles J. Whalen.

Original Articles

ACUTE INFECTIONS OF THE UPPER LIP

J. NORMAN ELLIOTT, M. D.

BLOOMINGTON, ILL.

The purpose of this paper is to call attention again to infections of the upper lip and of the face in the so-called danger area. Hunter defines this danger zone "as the area between the hair line of the forehead above and chin below, with two parallel lines connecting this area at the outer wall of the orbits on each side." Roberts considers a carbuncle of the face as one of the most dangerous of all infections and advises hospitalization for every case.

In spite of the fact that these lesions have been considered dangerous for many years, comparatively little as to their serious nature is known by the laity. To anyone who has seen one or more of these cases go on to a fatal termination it seems that a wider knowledge of the subject and constant emphasis by medical men upon the danger of traumatization of infections of the upper lip and face would save many lives. Cutler observes that it is well to know when not to indulge in surgery, and points out that the treatment of simple infections often needs the greatest care and wisdom.

The importance of this subject was first impressed on my mind during my internship at Wesley Memorial Hospital seventeen years ago. One of my fellow interns developed a furuncle close to the center of the left cheek. Gradually the area around it became inflamed and tender so that there was obvious swelling and elevation of the tissues about the small central area of acute inflammation. He went to Dr. Kanavel and asked what he should do; and Dr. Kanavel replied, "Go to bed immediately. Put on a big warm wet dressing, and don't let anyone touch it with a knife." Instead of taking that advice he went to his home, persuaded someone to incise it. Three days later he succumbed to a rapidly spreading infection and septicemia.

Some time later a young woman from Gary, Indiana, was admitted to the hospital on Dr. Kanavel's service. She had had a furuncle of the right side of the upper lip. She had squeezed it in the hope of expressing pus, and subsequently a doctor had repeated the procedure. When she came to the hospital the entire face was tremendously swollen and dusky from congestion. The eyelids were closed and the contents of both orbits were protruding as though pushed forward by great pressure behind them. She died within twenty-four hours after admission. The autopsy showed thrombosis of both cavernous sinuses.

A third case with a similar fatal complication came under my observation a few years ago in Detroit. We had a patient admitted to the hospital with an infection of the upper lip. Temperature was about 101, pain was severe, terrific headache, and considerable edema of the upper lip. This infection was incised by the house physician. After the incision, the infection spread rapidly and within four days the patient succumbed to a general septicemia.

Anatomy. A consideration of the anatomy, first of all, is necessary to an understanding of the severity of the lesions under consideration.

The upper lip and nose are covered by loose skin and subcutaneous tissue. Underneath them are the muscles of expression. These muscles take their origin in the bones of the face and insert into the deep portion of the skin. A rich plexus of vessels lies deep in the muscles of expression surrounded by subcutaneous tissue. The skin especially of the upper lip is in constant motion and this tends to prevent localization of infection.

The venous drainage of this area is through the facial vein which normally flows into the internal jugular. The angular vein, a tributary of the facial, anastomoses with the superior ophthalmic vein which empties into the cavernous sinus. Thus the drainage from the upper lip and face communicates with the cavernous sinus. Normally the blood from the face does not drain into the cavernous sinus, but when the facial vein or its contributaries are obstructed by thrombophlebitis or edema the current may be reversed and septic emboli pass into the cavernous sinus with a resulting bacterial meningitis, or a sinus thrombosis. Progressive thrombosis of the facial, angular and superior ophthalmic veins may involve the cavernous sinus. Another point brought out by Cutler is the presence of a small anastomosis between the facial

Read before Joint Session of Sections on Medicine, Surgery, Eye, Ear, Nose & Throat, Public Health & Hygiene and Radiology Illinois State Medical Society, Peoria, May 20, 1937

vein and the inferior orbital vein, and a deeper communication between the pterygomaxillary veins and the cavernous sinus. The veins themselves have no valves and the flow is slow.

For some reason not understood, but possibly to prevent respiration from exerting too sudden an effect on intracranial pressure, the cavernous sinus itself has a peculiar structure. It is cut up into many contiguous compartments which greatly impede the flow of blood.

Etiology. The causative organism of these infections is the staphylococcus aureus. There can also be a streptococcus infection, as pointed out by Collear, that enters cracks or fissures of the skin that may develop into erysipelas. However, the infections that form the carbuncles have nearly all proved to be due to staphylococcus aureus. The atrium may be through a scratch, abrasion or minor injury and is usually along a hair follicle or sebaceous gland. Immunity to this organism is not ordinarily present in the blood. Koslin has made a significant point in that he has never been able to find a case reported in a patient under twelve. This would confirm the impression that the infection gains entrance through the hair follicles and sebaceous glands, as they are not well developed before puberty. Diabetes is not a contributing factor in infections of the face but, as Totten has pointed out, high blood sugar in normal individuals contributes to repeated attacks of staphylococcus infections.

Symptoms. Any infection of this area, no matter how insignificant in the beginning, may develop into a major surgical tragedy. In careful questioning of patients that develop severe infections of the upper lip, a history of some trauma, even if slight, can usually be elicited. Totten makes the point that in a certain percentage of cases, however, there is no history of trauma. Patients are usually acutely ill when seen by the physician. The swelling, redness and edema are marked. The severe cases may have a chill. Fever may range from one to six degrees above normal. The pulse is usually rapid. Most patients complain of headache, which becomes severe. The symptoms will either begin to abate if the condition localizes or will become more severe with conjunctival injection, paralysis of ocular muscles, and other signs of cerebral invasion. Bailey states, "The sign which foretells impending danger is the spreading edema from the lip to the inner canthus in the presence of suffusion of the eyelids." This sign with considerable elevation of temperature is Bailey's indication for ligation of the angular vein. When the cavernous sinus is thrombosed the ocular muscles became paralysed by involvement of the nerves in the sheath of the sinus. With thrombosis of the ophthalmic vein and choking of the disc, vision is lost.

Treatment. Gamble divides infections of the face into three stages, namely:

1. Stage of pimple or papule formation.
2. Stage of extension.
3. Terminal stage of cavernous sinus thrombosis, septicemia or meningitis.

Collar's treatment is outlined as follows:

1. No pimple or pustule of the face should be squeezed or traumatized.
2. Any infection larger than a pimple should be treated according to the following plan:
   a) Rest in bed in hospital,
   b) Early radio therapy,
   c) Reduction of activity to a minimum, with no talking and with nasal feeding, if necessary,
   d) Application of hot wet packs.
3. When signs and symptoms show generalized infection the question of ligation of the angular vein arises.

During the first stage of pimple or pustule formation there is no doubt that we as physicians can do a great service by warning our patients about the dangers of these infections. Too few people know of the danger of these infections and a very emphatic statement from the physician will warn patients against traumatising them. Usually the explanation of the anasotomosis of the angular and ophthalmic veins and the dangers of the infection going to the cavernous sinus and the brain will suffice to awaken in the patient a consciousness of the dangers of any trauma.

No matter how slight the lesion, the patient should be advised to use hot wet packs on his face and avoid any trauma.

In the stage of extension, the patient should be hospitalized if at all possible. Hot wet packs of either boric solution or magnesium sulphate should be continuously applied. The diet should be liquid or soft so that there will be no chewing. A small duodenal tube can be passed into the stomach if necessary, either through the nose or mouth, depending on the site of the lesion. Supportive measures of any kind are indicated. Insulin in small doses can be given if patients have a high blood sugar but are not diabetic. If one likes foreign protein it can be given and many men report favorable results from its use. X-ray has been used with great success during this stage. Whitemore of the U. S. Navy advises the use of x-ray and urges that it be used early. He uses one half to one erythema dose of x-ray and states that the pain is usually relieved. If the pain is not relieved he considers the treatment a failure.

This conservative type of treatment has by far the largest group of followers. Koslin in 1931, reporting 18 cases from Lebannon Hospital, advised hot packs and gave instructions to the house staff forbidding expression of pus or slough or the use of the scalpel. He feels that the scalpel goes beyond the affected area and opens lymphatic and venous channels.

Cutler states that in 23 cases of serious infection of the lip, nose and cheek at Peter Bent Brigham hospital, either carbuncle or cellulitis, there was a mortality of 30.4%. In ten cases treated by simple surgical procedure the mortality was 50% as compared with 21.7% in untreated cases.

Martin advises strongly against early operation despite the fact that the doctor is urged to do something. He feels that it is dangerous to try to abort these early furuncles with phenol.

Dettrich, reporting in 40 cases of carbuncle of the upper lip, found a mortality of 5.5% in 18 cases treated without incision while in 22 cases treated by incision the mortality was 13.6%.

In an article in the J. A. M. A. of June 13, 1937, Ayres Anderson and Foster, in dealing with treatment of carbuncles, stress conservative treatment. They use x-ray of one-fourth to one-half skin unit to affected area, autogenous vaccine, wet dressings of Alibour water and late incision if pus is present.

Totten, in a very excellent paper in 1935, combines a conservative treatment in the early stages with a cautery puncture. In 15 of the 31 cases the use of hot continuous boric acid or magnesium sulphate solution with complete anatomical and physiological rest was all that was necessary. In cases which do not respond to this treatment he uses cautery puncture.

Among those who advocate a radical procedure are Powers, Sheeley, and Bradburn.

In cases in which the general circulation has been invaded and in those cases in which the cranial cavity has been invaded any form of treatment will be discouraging.

Summary. The whole subject of treatment can be summed up admirably in the words of Dr. Blair: "I have never seen a fatal result in a case treated conservatively by non-operative measures, that is, which has not been pinched, injected, incised, or otherwise traumatized either by the patient or surgeon; and every fatal case that has come under my observation has been subjected to some one of the above procedures. This condemnation of surgical interference does not apply to well developed abscesses in which there has been sufficient time for the development of a protective surrounding wall, nor to the destruction of the whole infected area by the use of an actual cautery."

When one contrasts the results obtained by Blair with the tragic results of the three cases described at the outset one naturally turns to a conservative plan of treatment.

In a small series of cases that have been under our observation, and in a further series of cases under the care of other surgeons with whom I have been in touch, conservative treatment—i. e., the application of massive, warm wet sterile dressings, the application of heat over the dressings with the help of an infra-red light or a large electric bulb suspended over the dressing, and abstinence from active surgical treatment except the gentle removal with sterile forceps of obviously necrotic tissue which might be blocking drainage—has consistently produced satisfactory results and eventual healing without disability and with little scar formation.

I wish to express my appreciation for the advice and help of Dr. Sumner L. Koch in preparing this paper.

FUNDAMENTALS OF SERUM THERAPY

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Within recent years, the employment of serums of various types in the control and treatment of infectious diseases has made rapid advances. Inasmuch as the State Department of Public Health distributes certain serum preparations to the medical profession of the state without charge, it was felt that a review of the field of serum therapy and prophylaxis was indicated at this time. An attempt will be made to indicate which serum preparations are of distinct value, and to separate from this group those preparations which are of doubtful value, or in the experimental stage of development.

It has been known for many years that human beings who recovered from certain of the infectious diseases developed immune substances in their bodies as a result of having recovered, which thereafter generally protected them against a second attack of the disease. As an illustration, the patient who recovers from an attack of diphtheria produces diptheria antitoxin in his body, which if developed rapidly enough, results in neutralization of the circulating toxin generated by the organisms at the site of the focal infection in the nose and throat. Following the discovery by Von Behring and Kitasato[1] in 1890 that diphtheria antitoxin could be obtained by injecting laboratory animals with diphtheria toxin, attempts were made to produce antitoxin in large animals in sufficient quantities to produce a supply for treating human beings who had diphtheria. Diphtheria antitoxin was first used in treating diphtheria by Von Behring[2] in 1894, and the method was so successful that in a few years it came into general use. The results obtained were very striking, and physicians finally had at their disposal a specific therapeutic agent for treating this dreaded disease. The use of diphtheria antitoxin spread rapidly, and soon it was employed throughout the entire civilized world.

The phenomenal success which attended the introduction of diphtheria antitoxin stimulated investigators to make studies on other diseases, hoping that antitoxin or antiserums could be developed for therapeutic purposes for all communicable diseases, thereby making the treatment of them a relatively simple procedure. However, after attempts to develop antisera against most of the common infectious diseases to which man is heir, laboratory workers were much disappointed to discover that antisera could be developed for only a small number of diseases. In some instances, as in diphtheria, the bacteria causing the disease secreted a soluble toxin, against which antitoxin could be readily developed. In other instances, the antisera were developed following the injection of dead or living bacteria, with the result that the active constituents of the antisera were antibacterial rather than antitoxic in nature. At the present time the most important conditions in which serum is of value either for therapeusis or prophylaxis are diphtheria, scarlet fever, meningococcic meningitis, pneumococcic pneumonia, bacillary dysentery, tetanus, and snake bites. I shall discuss each of these products separately, with a consideration of the indications, mode and amount of injections, and after-effects of each.

Diphtheria. Diphtheria antitoxin has been employed more extensively than any other serum known to medicine. The standardization of antitoxin is now on a very sound basis, and there is no reason why potent diphtheria antitoxin should not be used. It is known that in all diseases in which serum therapy is employed, the value of the product from a clinical point of view depends upon the administration of the product in the early stages of the disease. It has been shown many times that diphtheria antitoxin is most effective on the first day of illness, and the effectiveness decreases proportionately with each day of delay. Diphtheria antitoxin should be administered immediately to every patient who is suspected of having diphtheria. For many years injections of 5,000 to 10,000 units of antitoxin were administered, but it has been found that this quantity is inadequate. One large dose of antitoxin administered in the early stages of the illness is far superior to small divided doses. Consequently, antitoxin for therapeutic purposes is now distributed only in 20,000 unit packages by the Illinois Department of Public Health. It is our feeling that if the patient needs antitoxin at all, he needs at least

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20,000 units. The intramuscular route of injection is the method of choice for most cases, but in very severe cases the intravenous as well as the intramuscular route should be employed. However, before an intravenous injection is given, one should ascertain whether or not the patient is sensitive to horse serum protein. Serum injected intramuscularly is absorbed slowly, and several hours elapse before it reaches the general circulation in sufficient quantity to be of value. A combination of the two routes in severe cases is preferred, the intravenous injection taking care of the immediate needs of the patient, whereas an additional amount of serum is gradually absorbed into the blood stream from the intramuscular depot over a period of several hours. Mild cases of diphtheria should receive at least 20,000 units of antitoxin, while severe and malignant cases should receive from 40,000 to 100,000 units.

When diphtheria antitoxin was first discovered, it was employed for prophylactic purposes on a very wide scale following exposure to the disease. However, since the development of diphtheria toxoid for active immunization, the use of antitoxin as a prophylactic has decreased to a marked extent. In short, it is the responsibility of the family physician to see that all children in his practice are immunized with diphtheria toxoid early in life, thereby eliminating the necessity of injections of prophylactic doses of antitoxin following exposure to a case of diphtheria. In the State of Illinois diphtheria immunization has been employed on a wide scale, and the medical profession in general is to be commended for its efforts in this direction. However, many thousands of children are still unprotected, and every effort should be made by physicians and parents to see that these children are protected against diphtheria. This applies especially to children between the ages of nine months and six years. The one-thousand-unit prophylactic dose of diphtheria antitoxin should be employed only in persons who have come into close contact with a diphtheria patient. Younger brothers and sisters and classmates who have had close contact are included in this group for the most part. Unless there is sufficient reason to believe that close contact has actually taken place, it is best not to take the chance of senitizing a child to horse serum with a prophylactic injection of antitoxin. Inasmuch as most adults are naturally immune to diphtheria, the administration of the prophylactic dose of antitoxin is unnecessary. *It should always be borne in* mind that the serum is rapidly eliminated from the body, and the protection conferred by the injection lasts for only a period of two or three weeks, therefore active immunization with toxoid should follow in about four weeks.

Scarlet Fever. The discovery in 1923 by Doctors George and Gladys Dick[3] that scarlet fever was essentially a toxemia from hemolytic streptococci localized in the nose and throat, led to the development of *steptococcus scarletinae* antitoxin for treating cases of this disease. This product is employed by physicians on a much wider scale than is generally realized, particularly for the most severe cases. Following an intramuscular injection varying from 6,000 to 12,000 units, (the dose varies considerably in preparations of different manufacturers) there is a drop in temperature, disappearance of the rash and a general improvement in the toxic condition of the patient. However, the general mildness of scarlet fever as we see it at the present time, with a low fatality rate, coupled with delayed serum sickness in a certain percentage of the cases have been factors which have mitigated against the use of scarlet fever antitoxin on a scale comparable to that in which diphtheria antitoxin is employed. Nevertheless, there is no doubt as to its value in severe toxic cases of scarlet fever, and it has been definitely shown by several investigators that the fatality rate can be reduced following its use. However, it has been of little benefit in treating the complications of scarlet fever.

The use of streptococcus scarletinae antitoxin as a prophylactic measure is not very widely employed by physicians at the present time, and is not recommended by the State Department of Public Health. Only 10% of children exposed to scarlet fever come down with the disease, and it is not justifiable to incur the chance of serum sickness when the possibility of contracting scarlet fever is so small. The short time required to carry out a Dick test makes it possible to determine which persons are susceptible to scarlet fever, following which only young children in the same family, and classmates should receive prophylactic injections.

The use of human convalescents' serum in treating scarlet fever is not a new procedure by

any means; it was used in 1912 in Germany by Reiss and Jungmann. Within recent years this procedure has gradually assumed greater popularity, and it has been shown by Hoyne, Levinson and Thalhimer[4] to be of definite value in severe cases. However, the limited supply of human convalescents' serum for treating scarlet fever renders it unlikely that this product can be employed on a wide scale, therefore making it necessary to continue the preparation of scarlet fever antitoxin for commercial use.

Meningococcic Meningitis. This disease has been treated by serum since 1913, when an antiserum was developed by injecting living meningococci into laboratory animals. The resulting preparation, accordingly, was antibacterial rather than antitoxic in nature. Inasmuch as there are four different types of meningococci, all types are injected and a polyvalent serum is produced. Variations in the types of the meningococci have occurred in some outbreaks of the disease, against which standard polyvalent serum is not effective. However, the discovery within recent years by Ferry[5] and his collaborators that the meningococcus elaborates a toxin, has led to the development of meningococcus antitoxin. Administration of this product by the intravenous route, when diluted with saline or glucose solution, has resulted in a marked decrease in the fatality rate in the hands of Hoyne[6] and Tucker.[7] The fact that meningitis is a systemic infection rather than a primary infection of the central nervous system has led to the preference for the intravenous, rather than the intraspinous route of injection.

Pneumococcus Pneumonia. The discovery of the soluble specific substance in pneumococci by Avery and Heidelberger[8] in 1924 established a basis upon which an antiserum against the pneumococcus was first developed. This is an instance of an antiserum being developed against a bacterial product. As in the preparation of most other sera, horses are used for the preparation of antipneumococcus serum in large quantities. For many years, only four types of pneumococci were recognizable, the first three of which could be definitely separated from the others, and the fourth type provided a waste basket into which all other unclassified types of pneumococci were thrown. Studies for the past fifteen years at the Rockefeller Institute have shown that an antiserum against the type I pneumococcus can be developed which has been followed by a fair degree of success in the treatment of type I pneumococcus pneumonia. Within recent years, type II pneumococcus pneumonia has also been treated successfully with a specific antiserum. However, type III pneumonia has never responded favorably to serum therapy. Felton[9] has refined and concentrated the active constituents of antipneumococcus serum, and this product is known as Felton's Refined Pneumococcus Antibody Solution. By employing this product by the intravenous route, Felton has been able to reduce the fatality rate in type I and II pneumococcus pneumonia about 50%.

Monovalent pneumococcus antisera as well as polyvalent antisera are now obtainable on the market. The development of the Neufeldt method of typing of pneumococci has made available a rapid method for determining the type of pneumococcus which is present in many cases of pneumococcus pneumonia. With this procedure, it is best to administer type specific antiserum at once, a procedure which has resulted in a marked reduction in the fatality rate of pneumococcus pneumonia. Unfortunately, pneumococcus antiserum is not employed on a scale commensurate with its value, and for this reason we recommend the use of this product on a wider scale. It may be of interest to know that within the past ten days the Legislature of the State of New York has appropriated $400,000 for the purpose of making pneumococcus antiserum available free of charge to physicians throughout the state for treating their cases of pneumococcus pneumonia. Unfortunately the Illinois Department of Public Health does not now have sufficient funds at its disposal for providing this product for the physicians of Illinois.

Tetanus. At the present time tetanus antitoxin is used almost entirely as a prophylactic measure. As a matter of fact, the increasing number of automobile accidents, in which wounds are contaminated with street dirt and soil, renders the administration of a prophylactic injection of tetanus antitoxin mandatory on the part of the physician. The dose administered is 1500 units, generally by the intramuscular route. The value of this product was conclusively proven during the world war, at which time all wounded men in the allied armies were given prophylactic injections of

tetanus antitoxin. War wounds inflicted by bullets and ragged propectiles were contaminated with soil in the majority of instances, and the losses from tetanus during the early days of the war were alarming. The fact that tetanus spores may remain viable in old scars and wounds for many months led to an order from the Chief of the Army Medical Staff that all men receiving operations for war injuries several months later were to receive a prophylactic injection of tetanus antitoxin before the operation was carried out. In the case of infections which persist, injections should be repeated every eight or ten days.

When tetanus has already developed, the use of tetanus antitoxin as a therapeutic measure is limited because the tetanus toxin has already united with the nerve tissue and is not reached by the antitoxin. Injections by the intraspinal route are preferred by some physicians following the withdrawal of a slightly greater amount of spinal fluid. However, intramuscular and intravenous injections should also be made, and from 60,000 to 100,000 in all should be given. The whole procedure should be repeated daily if indicated. In general, the treatment of tetanus is quite unsatisfactory, and half of the cases terminate fatally in spite of the administration of antitoxin.

Anti-Dysentery Serum. Since the work of Shiga on bacillary dysentery in 1895, antitoxic serums for the treatment of this disease have assumed increasing importance. Bacillary dysentery, as is true in other diseases of the gastrointestinal tract such as typhoid fever, has been markedly reduced during the past generation along with the development of pure drinking water and the establishment of sanitary sewage disposal facilities. However, cases of the disease come to our attention rather frequently, particularly in eleemosynary institutions. A polyvalent antiserum for treating dysentery is available, which is very effective. The general prostration and acute toxemia disappear rapidly following its use, and the local intestinal involvment is greatly diminished.

Antivenins. In the field of immunology one of the early discoveries was that specific antisera could be developed against the poisonous snake venoms. At the present time, a polyvalent serum is available in this country which has been used effectively for the treatment of persons following rattle snake, water moccasin and copperhead bites.

Human Convalescents' Serum. Within recent years the use of human convalescents' serum has received a great deal of attention, particularly in treating poliomyelitis. There is a controversy as to the merits of this product in treating cases of poliomyelitis at the present time. The Illinois Department of Public Health has employed this product for the past five years with satisfactory results according to the opinion of the Medical Staff. The serum is now made available to physicians free of charge for treating their patients with poliomyelitis, and it is recommended that doses varying from 160 to 200 cc. be employed for persons over 12 years of age, 120 to 160 for persons from 6 to 12 years, and from 80 to 120 for persons under 6. Injection by the intravenous route is advised, although the intramuscular route or a combination of the intravenous and intramuscular routes is of great value. It is not contended that nerve tissue which has already been destroyed will be regenerated following the administration of serum. Clinical observation in pre-paralytic and early paralyzed cases have resulted in a rapid return of the temperature to normal, disappearance of the toxic condition and cessation of progress of early paralysis. It is our feeling that this product should be used in large amounts in contrast to the small quantities which were employed in New York in 1931. Inasmuch as this is human serum, untoward reactions are negligible and physicians need not fear serum sickness of the type which follows the use of horse serum products. It has been impossible to employ serum in alternate cases in this state, therefore a carefully controlled study is unavailable at this time. However, the good results obtained following the use of this preparation in our hands has strengthened our feeling that the use of this product should be continued until a more effective therapeutic agent is made available to the medical profession for treating poliomyelitis.

Other Convalescents' Sera. Human convalescents' sera have been used in the treatment of chickenpox, measles and mumps with a reasonable degree of success, although not yet on a large scale.

Desensitization. With the increased employment of serums for therapy and prophylaxis, the possibilities of serum sensitization should be con-

sidered, inasmuch as most serums are produced in horses. Accordingly, every physician who is about to administer serum should first carry out an intradermal skin test with 0.1 cc. of the serum diluted 1-10 in physiological saline. If the patient is sensitive to horse serum protein, a large wheal will appear at the site of the injection ten to thirty minutes later. In such cases, desensitization is best carried out by injecting gradually increasing doses of the serum by the subcutaneous route. The recommended procedure is to make an injection every thirty minutes, beginning with a dose of 0.5 cc. and doubling the dose at each subsequent injection. This procedure should be continued until the entire amount of a full therapeutic dose has been administered, following which additional intramuscular and intravenous injections may be made without danger. It is encouraging to note that serum reactions are becoming less frequent since refinement and concentration procedures have been applied to commercial serum products. Physicians should be certain that a syringe containing 1 cc. of adrenalin chloride is at hand when serum injections are being made, in order to combat any signs of immediate serum sickness.

Serum Reactions. Very rarely, an immediate anaphylactic reaction occurs in persons who are sensitive to serum products, or who have a history of previous asthmatic attacks. Park has observed such reactions in about one in each thousand persons who received diphtheria antitoxin. The symptoms are prostration, rapid and feeble pulse, nausea and a sensation of suffocation. Artificial respiration and injections of adrenalin chloride generally bring about complete recovery. Persons with a history of asthma should not receive serum unless absolutely necessary, and then only with extreme caution.

In our experience, delayed serum sickness has occurred in as high as 50% of persons to whom an animal serum preparation has been administered. The usual symptoms are elevation in temperature, prostration, joint pains and an urticarial eruption, which appear from one to two weeks after injection. Previous desensitization does not prevent the development of delayed serum sickness. Injections of 0.5 cc. to 1.0 cc. of adrenalin chloride once or twice daily should be employed, and calomine lotion and a sodium bicarbonate bath will relieve the irritation from the urticaria. This type of serum sickness is rarely fatal. Serum sickness has not yet been observed by us following administration of human convalescents' serum in several hundred cases of poliomyelitis.

Summary

1. Administration of serum for therapeutic purposes in most communicable diseases is of greatest value when the diagnoses is made early, and the serum is given promptly. The value of serum therapy decreases proportionately with each day of delay.

2. A history should be obtained of previous serum administration and asthmatic attacks. If any doubt exists, an intracutaneous test should be made to determine presence or absence of sensitization. If the patient is hypersensitive, desensitization with fractional subcutaneous doses of serum at 30 minute intervals should be carried out.

3. Intramuscular injections are preferred in prophylaxis.

4. The intravenous route is preferable for administering serum to persons who are extremely ill, and a simultaneous intramuscular injection should also be given.

5. The intravenous route is preferable for administering human convalescents' serum in scarlet fever and poliomyelitis.

6. Serums should always be warmed to body temperature before injection.

7. All injections of serum should be made very slowly.

8. Prophylactic serum injections for temporary protection against diphtheria and scarlet fever should be given only to small children who have had close contact with the patient.

9. Physicians should stimulate prophylactic inoculations, particularly against diphtheria with the use of diphtheria toxoid, thereby eliminating the necessity for prophylactic injections of diphtheria antitoxin.

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DISCUSSION

Dr. George L. Drennan, Jacksonville: It may be beyond the resources of the modern epidemiologist and family physician to prevent the mortalities from all of the diseases referred to by Dr. Tucker. But much has been done and still more will be done. We have traveled far from the days when our progenitors argued as to whether diseases were caused by mechanistic or vitalistic actions, or were the result of fermentation or spontaneous generation, miasmic factors, etc., to the conception of today that infection is the result of the metabolic processes of organisms that utilize the living tissue of a host for their growth and survival.

And while it may not be possible to prevent death in every instance when the disease is present, much marring of life may be avoided and much happiness brought about by the application of present day knowledge and accepted procedures for the prevention of these diseases. It is not, however, within the scope of this discussion to dwell on preventive measures except as they apply in prophylaxis and treatment.

Although it may not be possible to stamp out all of these diseases, or to prevent death in those in whom the disease is fully developed, yet within the province of the modern epidemiologist, pediatrician, and family physician lies the early stage of all these, and if we are to treat them intelligently we must be usefully informed about them.

It is fundamental at the onset to appreciate some facts about infection and immunity. Some infection may be defined as the result which is brought about in the host by the metabolic process of an organism or as the derangement in the host, either local or general, that results when organisms have passed through a portal of entry in the host and have gained access to susceptible tissue.

The human host, through long years of exposure, has adapted itself so that the entodermic and ectodermic coverings of the body prevent the ingress of the ordinary bacteria that could attack the vital hidden parts beneath. A break in the host's defense mechanism will provide an entrance through which organisms may come in contact with tissues not prepared to meet the onslaught of the invader. It is important to know the portal through which an organism gains access to the undefended tissue, since diseases have a regular or usual portal of entry. If we know the portal, we usually know the site where the host first complains of symptoms, and we can sometimes guess the genus of the offending organism.

As a result of infection, several conditions may develop, dependent upon the patient's resistance. The offending organisms may multiply to the extent that they enter the blood stream; bacteremia will then develop. The disease may cause such an increase in the white cells of the blood elements that abscesses and pyemia will result. The organisms may shunt their metabolic products into the blood stream to be carried everywhere, resulting in a toxemia, or the bacteria may multiply to such an extent that, with their toxins, a condition of septicemia may be noted.

Although the organisms may gain access to the host or reach a susceptible organ in such numbers as would ordinarily cause a disease, they must have time to multiply in these favorable areas before the alterations that are produced in the host are recognized as disease. An undisturbed incubation period, then, of a relatively shorter or longer time, is an absolute essential in order to enable the organism to produce the disease in the host. It may take a long while to bring about typhoid fever. On the other hand, the organisms that cause scarlet fever may multiply sufficiently to cause the disease within twenty-four to forty-eight hours.

Knowledge of the time of exposure and the ordinary incubation period of these diseases is most important because it is during this period when we can do most for many who have been exposed. It is during the incubation period and the very early stage of the disease that we must do all that we can if we are to show evidences of having progressed from that dark age of medicine when discussions were heard about mechanistic and vitalistic activities, etc. It is at this stage that we can aid the host by conferring an artificial passive immunity to the metabolic process of the invading organism. This necessarily presupposes two things: 1. A careful, painstaking history regarding exposure and, 2, accurate early diagnosis. A third should be emphasized—a thorough working knowledge of the available antitoxins and antisera.

These bacteria, when they have gained entrance into susceptible tissue, multiply rapidly and produce toxins steadily. Every hour and every minute sees the development of millions of bacteria or quantities of toxin which will require thousands of units of antitoxin to neutralize. The tetanus bacillus in the incubation period of a week to twelve or fourteen days produces and transmits to all parts of the body, toxins in such quantities that neutralization is almost impossible, whereas a small dose of 1500 units within twenty-four hours of exposure protects the host against the disease.

Today, if we are to do anything for a patient with poliomyelitis it must be done before paralysis has developed.

It seems almost useless to discuss the use of diphtheria antitoxin; however, one point cannot be overemphasized, namely, the early administration of a single dose sufficient to bring about immediate improvement.

Innumerable articles have been written about the therapeutic results obtained with the use of anti-meningococcus serum and meningococcus antitoxin, and from these it is apparent that the so-called fulminating type of the disease is usually not amenable to any treatment and the patient dies within six to forty-eight hours. In this disease, early diagnosis, keeping in mind that the meningitis is often, in the earliest stage, a small localized process which can only be diagnosed by very careful examination, including spinal puncture; and the prompt administration of antiserum and anti-

toxin may mean the difference between death and recovery.

Scarlet fever in its present day mild form seems to require no specific treatment, but all reports agree that the early administration of convalescent serum or antitoxin will prevent, in many instances, the dire complications which are so frequently more serious than the disease itself.

In treating any of these diseases it must be remembered that when the conflagration has started and is spreading, we are dealing with a serious threat to life. Many of these need never occur, but when they do occur how much more reasonable it is to prevent the development of fully developed disease by careful, accurate early diagnosis and the prompt administration of the specific antitoxins, antisera and convalescent sera. All this is the responsibility of the family physician, pediatrician and epidemiologist.

THE USE OF POOLED HUMAN CONVALESCENT SCARLET FEVER SERUM IN SURGICAL STREPTOCOCCIC INFECTIONS*

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The treatment of fulminating, overwhelming streptococcus infections with convalescent human serum dates back at least ten years, when its use was reported by Boente,[1] in Germany. Killian,[2] also a German, reported on its use in 1928. In 1935, Thalheimer and Levinson[3] reported their experiences with the use of serum in a group of diverse streptococcus infections. Recently there have been several case reports by Baum,[4] Holmblad and Jacobsen[5] and McWhorter.[6]

It is very difficult to evaluate the results of serum therapy accurately for several reasons. Most of the physicians who have been supplied with serum by the Samuel Deutsch Serum Center have been very cooperative in reporting the results of its use, but it is impossible to get all the details from them. Obviously no control group of comparable patients can be obtained. Most of these patients have received other types of therapy, including surgical drainage, parenteral fluids, local heat, blood transfusions, other sera or vaccines, etc., and it is a matter of conjecture which agent plays the most important role. For these reasons we do not know what the outcome would be in this particular group of patients without the use of serum. Gregory and Schwartzman,[7] however, report a mortality of 75% in a group of peripheral surgical infections during the middle years of life; and Shepar, Spence, and Mac Neal[8] report thirteen cases, treated with antistreptococcus horse serum with five deaths, a mortality of about 38%. They report several severe reactions.

In the group of cases reported by Thalhimer and Levinson, there were 26 cases of "sepsis" and septic complications, six of streptococcic cellulitis or phlegmon, three streptococcic arthritis, three streptococcic peritonitis. Of this group of 38 that we can class as surgical sepsis, there were eleven deaths, eight from "sepsis," two from cellulitis, and one from peritonitis, a mortality of about 30%.

Since 1935, we have collected from the Serum Center records and from my private practice a group of 28 additional cases of clinical surgical "sepsis," including lymphangeitis, cellulitis, lymphadenitis, gangrene, phlebitis and post-operative infections. These patients ranged in age from five years up to 65, five being below fifteen years of age, and the remainder adults. In the group there are four fatalities, 24 recoveries, a mortality of only 15%. Each of these patients was critically ill at the time serum was administered, and in most cases the attending physician considered the prognosis very grave, and asked for serum as a measure of last resort. Each of my own patients was practically moribund at some stage of their illness. In this group most of the patients were given larger doses of serum than had been previously employed.

The four fatal cases deserve a few words. One was a diabetic gangrene of the arm in a woman of forty, who received 80 cc. of serum intravenously without any appreciable general or local effect. The second was a lymphangeitis and sepsis following a cut thumb. Here only 40 cc. of serum was given intramuscularly to an adult of forty-one; in these two cases the trial of serum therapy was undoubtedly inadequate. The third was a subacute inguinal adenitis, which we believe now to have been a Meleney type of anerobic streptococcic infection of the leg. Three doses of 100 cc. each of serum were given on the 24th, 28th and 31st day of the illness, with slight, if any, effect on the process. This woman died of erosion of the femoral artery and hemorrhage on the 37th day of the

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illness. The fourth fatality occurred in a youngster of ten, who had an abscess of the leg with inguinal adenitis and sepsis. Multiple transfusions were given for sixteen days without effect. On that day 40 cc. of serum was given intravenously with little effect. The child died the next day.

The 24 cases that recovered obviously cannot be discussed in detail at this time. I shall abstract two of the cases that I followed personally. The clinical pictures of course cannot be portrayed on the slides of the temperature and pulse charts that I shall show. The changes in the mental reactions of the patients, the changes in attitude, appetite, pulse quality, toxicity, etc., are the most marked results of serum therapy, but unfortunately we have no units in which to measure these.

Case 1. Mrs. C, aged 40 years, weight 251, was bitten by a mosquito on the left ankle on September 24. I saw her at 8:00 P. M., September 29. Forty-eight hours previously she scratched the bite. The afternoon of the 29th the lesion broke and drained several drops of serum. Examination revealed no fever, no change in pulse, but an area of redness one inch in diameter surrounding the lesion. The usual heat, elevation and rest were advised. By midnight her temperature was 102°, and the redness involved an area about three inches in diameter. At 6:00 A. M. the next morning, she had a chill followed by a temperature rise to 103°, and she was hospitalized. Before 4:00 P. M. she had several chills. At that time her temperature was 104.8°, her pulse rate 120. The entire leg from knee to ankle was indurated, red, angry, tender, and very hot. There was left inguinal and lower abdominal tenderness. She was very toxic, delirious, flushed, and dry. Her leucocyte count was 4,000. General physical examination by a medical consultant was otherwise negative. At 4:00 P. M. she was given 100 cc. of pooled human convalescent scarlet fever serum intravenously. Within one hour the picture had changed completely. The patient was sitting up in bed asking for food and water, talking with both nurses and doctors. At 8:00 P. M. her temperature was 103°, pulse 100. The leg looked less red, but was still quite edematous. The abdomen and groin were not tender. By noon the next day her temperature was 101°, and the leucocyte count had reached 12,000. The leg redness and edema subsided somewhat. She was given another 100 cc. of serum intravenously that evening, with a further drop in temperature that night. The rise in temperature the next day is attributed to ultra-violet light erythema, which treatment was given on that day in an attempt to influence the local condition. The fourth day her temperature was normal; the leg was practically well, except for the blistering due to ultra-violet light; she left the hospital on the twelfth day.

Watching the development of this fulminating infection associated with a leucopenia, in an obese woman of forty years, and watching the rapid subsidence of all signs and symptoms within one hour after administration of serum, one could not help but feel that the administration of serum was the specific effective therapeutic measure in this case.

The results of serum administration are not always as rapid, as striking, nor as permanent. This is illustrated in the following case:

Case 2. Mr. M. P., aged 55 years, stuck a splinter into the dorsum of his right thumb on January 20, 1936. He removed it with a needle. On the 23rd he noticed a small area of redness; on the 24th this increased in size, and there were a few lymphangitic streaks reaching his wrist. He was adequately treated at home by his doctor, but continued to get worse and was hospitalized on the 27th. On admission his temperature was 102.8° rectally, his pulse 118. There was marked swelling and redness of the entire thumb extending to the wrist, with a central area about one inch in diameter that was blue and fluctuant, with two minute openings draining a few drops of pus. Lymphangitic streaks extended to the axilla, where several tender nodes were palpated. His leucocyte count was 21,000. A small incision was made into the blue area and a lake of pus was evacuated. No further manipulating was done, and huge hot dressings were applied over the entire arm, which was immobilized and elevated.

The next morning the streaks were less noticeable, but that afternoon there was a chill and a rise in temperature to 104.8°, with a drop that evening to 101.6°. Following a chill the next afternoon his temperature reached 106°; he became delirious, irrational, cyanotic, and lapsed into semi-coma. The arm was the seat of a rapidly spreading brawny cellulitis, which reached above the elbow. Eighty cc. of serum was given intravenously with definite but slight improvement which lasted for 12 hours, followed again by semi-coma and delirium. In the next 24 hours he was given two 100 cc. doses of serum intravenously, as well as 300 cc. of blood from a convalescent scarlet fever donor.

Following the second dose of serum he improved remarkably. The cyanosis disappeared; his temperature was lower and he had several lucid intervals. The improvement continued the next day, the 31st, but in spite of a lowered temperature, on February 1 he became toxic and delirious. Another transfusion of 300 cc. of convalescent blood was given, with little effect. On February 2 his condition was still worse, and he was given 100 cc. of serum with almost immediate marked improvement in his general condition. That night a lake of pus near his elbow was drained through a small stab wound made without anesthesia. By morning of the 3rd, his general condition was again very bad, so bad that the subpectoral space, which was definitely edematous and possibly fluctuant, was incised without the need of an anesthetic. A few cubic centimeters of thin serous fluid was obtained.

The cellulitis by this time, had spread up the neck and around the back beyond the midline and down to the sacrum.

We feel that drainage of the subpectoral space may have helped the patient, though his condition remained critical. The serum was continued daily, 100 cc. at a dose for four days, during which time he gradually improved. It seemed that the improvement was more marked in the 12 hours after administration of the serum. The local lesion faded gradually, and his convalescence, though delayed by a thrombophlebitis at the site of injection of glucose into an ankle vein, was uneventful.

Discussion—The dose of serum given a patient for hemolytic streptococcus infections is dictated by several factors, age, weight, severity of symptoms, and repeated doses are given as dictated by the course of the disease. The fear of possible reactions to the serum has for some time limited the dosage to relatively small amounts and to the intramuscular route, as this group of patients are so sick that the slightest reactions might prove fatal. After considerable experience with its use we have learned not to fear reactions and have increased the dose and repeated the administration of serum as necessary. We have used the intravenous route exclusively. No instance of any untoward reaction, or of the development of any sensitivity that would preclude repeated injections has been observed. The patient in Case 2 received a total of 680 cc. of serum, in 7 doses. Each dose was followed by clinical improvement, and when that improvement had gone, there was no hesitation about repeating the serum.

The theory upon which the use of serum is based is the inactivation or neutralization of streptococcus toxins in the circulation. The modus operandi is not known. In the first case the toxicity was quickly reduced to a large extent, while in the second case the reduction was less marked and less permanent, necessitating repeated dosages. We do not know the exact relationship between the reduction of toxicity and the primary lesion. Indirectly there is probably some connection, inasmuch as an individual overwhelmed by an infection probably cannot set up barriers to that injection as well as a more normal individual. This is illustrated by the leucocyte count in the first case, which rose markedly when the overwhelming infection was partially stemmed by the serum.

Attention should be called to the fact that this form of therapy is not as specific as would be desired. The pools of serum are made from blood taken from thirty to forty individuals recovering from a streptococcic infection contracted during the same season. In this way it is hoped to secure a rather uniformly potent polyvalent streptococcus serum, effective against those strains predominant in the community at the given time. Unfortunately we have no dependable or adequate laboratory test to determine potency of serum against a given strain of the organism. It is for this reason that the pooled serum in large dosage is employed. Undoubtedly, cases do occur in which the infecting organism is a strain not covered in the serum used, and it is possible that these are the cases showing no clinical response to serum therapy. Such instances are rare, and for the majority of infections, there are more or less specific antibodies which exert the beneficial effect that is observed. This may possibly explain the difference in response seen in the different cases; that is abrupt improvement when specific potency is high, and gradual improvement when it is lower. This is also the grounds for our belief that immunotransfusions, although helpful, are less effective because there is greater chance that the individual specimen of blood will have little direct specificity for the infection being treated. They should be used in conjunction with pooled serum.

Special emphasis must be placed on one fact. The use of serum should in no way effect the use of sound surgical principles of treatment, and of sound surgical judgment. Localized collections of pus should be drained, and incisions should not be made into areas in which the infection is not localized. Serum therapy is advocated only as an adjunct to these and to other supportive measures, and not as a substitute for them.

Summary

1. Twenty-eight cases of septic surgical streptococcus infections treated with pooled human convalescent scarlet fever serum are reported, with four fatalities, a mortality of 15% for the group.

2. This mortality compares favorably with previous reports of similar infections treated without the use of serum. While there are factors that have been discussed that make it difficult to evaluate these figures accurately, we feel that serum therapy is of definite value in this group of cases.

3. Serum therapy is not advocated as a substitute for sound surgical measures in this group of cases, but for use as an adjunct to these meas-

ures and other supportive therapy. When properly used, and in adequate dosage, we believe it to be a very valuable therapeutic agent.

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THE QUANTITATIVE NATURE OF IMMUNITY

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Few of us can qualify as experts in one phase of clinical medicine. None of us are experts in all phases. In the biologic treatment of infectious processes we must rely upon the recommendations of immunologists and pharmacologists. As a matter of practical experience most of us, on perfectly legitimate grounds, stick to the directions contained in packaged biologicals without further thought or investigation of the rationale or technic of treatment. We do the usual thing in the usual way, and feel that our responsibility to the patient is discharged.

Many of us have either observed or participated in the disillusioning consequences of such an attitude. The attitude of which I speak loses sight of the fact that immunity is always a relative affair.

In any infection the outcome depends upon a variety of extremely variable factors, such as the atrium of infection, the degree of trauma accompanying the entrance of bacteria into the body, the virulence of the microbe involved, the numbers of organisms entering the body, the presence of other pathogenic microbes, etc. In the same way the degree of resistance of the host is equally variable, depending upon his previous experience with the particular disease agents involved, and many other factors.

If we bear these things in mind we shall recognize the *quantitative* nature of immunity, and make every effort to fit every immunological procedure to the immediate problem of the patient rather than to fit the patient to an inflexible procedure.

To be specific, let me mention a few personal experiences. During the eight years I was in charge of the Nurses' Infirmary at Cook County Hospital, there were two cases of tetanus, both fatal. The first was in a nurse who received a slight laceration above one eye when she was thrown against the mirror in the front of an automobile. She was taken at once to a surgeon at the Cook County Hospital. The laceration was treated with mercurochrome, and a dressing applied. Because of the minor character of the injury, she did not report to the Infirmary until two days later. At that time, although the wound had not entirely healed, no suspicion of tetanus was aroused. Next day when she returned for a dressing she complained of slight headache, and a small tender gland was felt in front of the ear. A prophylactic dose of tetanus antitoxin (1500 units) was given and she was hospitalized for hot dressings to the lesion. The following day she had typical tetanus. In spite of large doses of tetanus antitoxin administered intraspinously and intravenously she died one day later.

The other patient was a nurse who received a slight puncture wound in her knee while at a bathing beach one evening. She thought the injury was from a wire which lay beneath the surface of the water. She reported to the Infirmary next day. The usual prophylactic dose of tetanus antitoxin (1500 units) was given, and hot boric packs advised. The lesion did not heal as promptly as was expected. Two days later the girl was hospitalized. Seven days after the injury another prophylactic dose was given. Two days later she developed typical tetanic convulsions, and in spite of intensive serum therapy, within 24 hours was dead.

In the two cases just cited, in addition, possibly, to inefficient local debridement of the wounds, there was an insufficient appreciation of the quantitative character of immunity against tetanus. Not enough prophylactic antitoxin was given. In the first case the importance of the delay in administering the antitoxin was not sufficiently realized.

A package of antitoxin bearing the same label and same lot number as that used in the second case was tested for potency in accordance with

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the standard procedure outlined by the laboratories of the U. S. Public Health Service. It was found to be as potent as claimed. Similar tests were made of three other well known brands. All were as potent as claimed. Apparently the failures to protect were not because of impotent serum.

Another experience was with diphtheria. During the first 17 months I cared for the Cook County Hospital nurses there were 29 cases of diphtheria among them. Of these, 14 were among nurses who had presumably been immunized against diphtheria by three doses of toxin-antitoxin under the supervision of my predecessor. Although this was the standard procedure at that time, toxin-antitoxin apparently afforded no protection whatever, because the incidence of diphtheria was higher in the supposedly protected group than in the non-immunized.[1]

Another experience was with scarlet fever. Some years ago a technician was hired for laboratory work in the Cook County Contagious Disease Hospital. Two days after starting her work she was Dick tested by the resident physician and found to be susceptible to scarlet fever. She was given 7.5 cc. of convalescent scarlet fever serum, the dose then being used at that hospital for prophylaxis. A Dick test made the day she received the convalescent serum, was, when observed the next day, positive. The following day she came down with typical scarlet fever. It had not been appreciated that 7.5 cc. of convalescent serum was inadequate to afford satisfactory passive protection against scarlet fever.

Such happenings as these—and many more could be cited from my own experience—probably occur because we are too prone to accept the experiences of others unquestioningly, and to forget that immunity is a strictly quantitative phenomenon.

First let us consider tetanus. The efficacy of tetanus antitoxin as a prophylactic measure has been proven beyond any shadow of a doubt.[2] Figures on file at the Surgeon General's office reveal that in the War of the Rebellion there were 505 cases of tetanus among 246,172 wounded—an incidence of 2 per 1,000. In the World War there were 223,047 wounded among the American forces, 26 of whom developed tetanus, an incidence of less than 2 per 10,000. In the World War tetanus antitoxin was used routinely on all wounded. Sir David Bruce of the British army reported an incidence of 15 to 32 cases per 1,000 wounded before routine administration of tetanus, and not over 2 or three per 1,000 after it was given routinely.[3]

However the fact remains that an astonishing number of cases of tetanus after prophylactic administration of antitoxin similar to the ones I have cited are now on record. In the Deutsche Zeitschrift fur Chirurgie of 1933, Hans Hanke[4] tells of two patients who received a prophylactic dose of tetanus antitoxin immediately after injury. One had symptoms of tetanus on the eighth day after injury, and died on the fifteenth day. The other came down with tetanus on the eighth day after injury, and died on the tenth day. Hanke cites 2,031 cases collected from the literature by Mosbacher in which tetanus developed after early administration of a prophylactic dose of antitoxin. Of this total, however, only 745 received the antitoxin within 12 hours of the injury. In this latter group, 28% died. The mortality in the group receiving antitoxin later than 12 hours from the receipt of the injury was, of course, much higher. These figures demonstrate that the feeling of complacency most of us have after the prophylactic administration of tetanus antitoxin is not justified.

It goes without saying that the local care of the wound is as important in preventing the disease as is the serum. Foreign bodies, if present, must be removed. Hot hypertonic wet dressings should be used to insure drainage. Some men favor the use of oxidizing agents such as hydrogen peroxide or potassium permanganate. Tulloch[5] has repeatedly recommended the complete excision of the infected focus in the case of small puncture wounds where tetanus has been proven by culture, or is strongly suspected. This procedure has much to recommend it.

In the giving of prophylactic antitoxin it is well to remember that when local conditions are favorable to the growth of tetanus bacilli the toxin is produced with amazing speed. From the first hour on it increases in geometric proportion. After a lapse of one hour in experimentally infected animals, 24 times as much antitoxin is required to preserve the animal as is required when the antitoxin is given at once.[6]

In the giving of antitoxin, this factor of time elapsed from the recept of injury and the degree of contamination of the wound should be the determining factor in deciding upon the dose. In the light of accumulating data, it seems likely

that the present routine dose of 1500 units for prophylaxis will give way to larger amounts. The risk of giving 2 to 4 cc. of serum instead of the usual 1 cc. to 2 cc., which now in most cases contains the prophylactic dose, is negligible. Since my unfortunate experiences, I give 3,000 units routinely except for the most trivial wounds, and sometimes more. Prophylactic doses of 1,500, 3,000, and 5,000 units are commercially available. One commercial house has a bovine serum which, although it is somewhat more expensive, is safer for use in individuals known to be sensitive to horse serum. In badly contaminated wounds which are slow in healing it is well to repeat the antitoxin every few days until healing is nearly complete. When operation at the site of a previously badly infected wound is undertaken an extra prophylactic dose should be given at the time of operation.

More experimental work on the prophylactic dose of antitoxin urgently needs to be done. So far I have been unable to find in the medical literature the basis for the present prophylactic dose of 1500 units.

With active treatment of tetanus I shall deal only very briefly. Once tetanus has developed no amount of serum appears sufficient to save the majority of the patients. However, the earlier the serum is administered and the larger the amounts given, the better will be the results. Many writers, notably Irons,[7] give extensive figures to support this point. Irons estimated that, as usually given, serum treatment has reduced the mortality in tetanus about 20%.

In the average case of tetanus in a person of 12 years or older, Kolmer[8] advocates a total dosage of 120,000 to 200,000 units. He advises 10,000 units intraspinuously and 20,000 units intravenously the first and second days; 10,000 units by each route on the third day; and 10,000 units intramuscularly the fourth day. A great many authorities advise much larger doses particularly by the intravenous route. The treatment should be continued until the issue is definitely settled.

Ramon,[9] a few years ago, introduced tetanus toxoid (a formalized filtrate) for active immunization. It is now being given routinely to French soldiers in doses of 1.0, 1.5, and 2.0 cc. with an interval of one month between the first and second doses and two weeks between the second and third. A few weeks after the last dose the average antitoxin titer of persons so immunized is 0.1 to 1.0 American units per cc. Just how efficacious this method will be cannot be determined until some large clinical experiment comparable to that afforded by the world war presents itself. In horses which are normally highly susceptible to tetanus toxoid to stimulate the subject's antibody tetanus introduced by the medium of spore laden splinters.[10]

Ramon gives typhoid vaccine along with tetanus toxoid to stimulate the subject's antibody mechanism. He has made the interesting observation that if a fourth injection is given several months or even years after this course of active immunization the subject's antitoxin titer will take a sudden bound to 10 or 20 times its former level.

Scarlet Fever. The necessity for bearing in mind constantly the quantitative nature of immunity is perhaps best illustrated in the case of scarlet fever. Had it not been for the foresight and tenacity of the Dicks in insisting upon this quantitative point of view, the practical value of their discoveries would probably have been lost to this generation. It was a lack of appreciation that scarlet fever toxin and antitoxin were definitely measurable substances that must be dealt with in a quantitative way which made the formation of the Scarlet Fever Committee necessary. After the first publications of the Dicks many biological houses began manufacturing material for active and passive immunization. The dosage was not uniform and the claims for potency were incorrect. In coöperation with the American Medical Association the Scarlet Fever Committee was formed to pass on the potency of all scarlet fever biologicals. In the early years, probably half of the materials submitted were not acceptable, and even now large batches of serum and toxin are frequently turned down because they are not as potent as claimed.

After many months of experimentation by the Dicks a skin test was decided upon of such strength that 90 to 95% of convalescent scarlet fever patients were found immune, and 5 to 10% still susceptible.[11] If this test is made by injecting exactly 0.1 cc. of properly diluted scarlet fever toxin into the skin of the volar surface of the forearm from a syringe and needle which have been boiled in distilled water and observed at 20-24 hours, it is a reliable test for immunity.

I reported an experience of two and a half years with the nurses of Cook County Hospital.[12] During this period there were 1280 undergraduate nurses on duty, 913 of whom received a Dick test. Five hundred and thirty three (58.4%) of these were found insusceptible. None contracted

scarlet fever. During the same period there were 15 cases among a group of 449 who were either not tested or immunized or were incompletely immunized. Since this report several thousand more have been tested. One case of scarlet fever has occurred in a Dick negative nurse. So far as I know this is the only instance in which a person found negative by the Scarlet Fever Committee has contracted scarlet fever. Rappaport[13] recently reported that no case of scarlet fever had occurred in a Dick negative nurse since the routine use of Dick tests was adopted at the Evanston Hospital in 1924. The test in my experience is the most reliable of the skin tests for susceptibility now available. However, the quantitative factors must be carefully observed or mistakes will result.

The present method for active immunization is the result of years of careful studies on many thousands of children and young adults. The aim of the Dicks was to perfect a method which would immunize as large a proportion of Dick positive individuals as would an attack of the disease itself. The present dosage of 500, 2000, 25,000, and 80,000 skin test doses given at weekly intervals will accomplish this. Consistently, retests performed two weeks after the last immunizing dose show that 95 to 100% have been successfully immunized. In my experience, no person immunized to the point of a negative Dick test by this method has contracted scarlet fever.

In active immunization the necessity for bearing in mind the quantitative character of the process warrants re-emphasis. It is known that very much less than the present total of immunizing units (115,500 skin test doses) will render a great many susceptible individuals Dick negative. However, the smaller total dosage will immunize a smaller percentage, and the immunity produced will be much more transient than when the regular dosage is used.

Examples were afforded by a commercial preparation of recinoleated scarlet fever antigen, which was on the market a few years ago, and Veldee's so-called scarlet fever toxoid. The ricinoleated product was supposed to immunize with one to three doses, and to do so with less reaction than occurred with the regular scarlet fever toxin. Tests made by the Scarlet Fever Committee showed it to contain approximately 2000 skin test doses per cc. This was too large for an initial dose and, of course, too small for the total dose. The reactions were severe and the immunity—if the doses were carried to the point of a negative Dick test at all—was not lasting. Many cases of scarlet fever occurred after its use. It was not understood that the mere attainment of a negative Dick test by active immunization does not imply lasting immunity. By this method many persons attained a partial immunity as demonstrated by a negative Dick test two weeks after the last dose. But the immunity was very transient because of the small amount of antigen used. The quantitative nature of the immunity mechanism was not understood.

Because of the success of toxoid in active immunization against diphtheria, it was hoped that a successful scarlet fever toxoid could be developed. Some years ago the Dicks, in close cooperation with Ramon, made several batches of formalized toxin and tried them in active immunization. The conclusion reached at that time was that, with scarlet fever toxin, as toxicity disappear antigenic value and antotixin combining power are proportionately reduced. After detoxification with formalin or alum, the ability to stimulate antibody production is proportional to the amount of free toxin remaining in the filtrate. The detoxified fraction appears to contain no antigenic properties.[14]

Many other workers, chiefly French, tried detoxified filtrates of scarlet fever streptococci in active immunization with no consistently successful results. In the past few years Veldee of the U. S. Public Health Service has made several reports on his preparation of so-called scarlet fever "toxoid"—the acetone insoluble portion of the toxin containing broth filtrate redissolved in broth and treated with 0.4% solution of formaldehyde, and stored at 37 C for about 60 days.

The Dicks obtained a supply of Veldee's preparation and used it in active immunization in the dosage he advised. The majority of persons receiving the material did not become immune to scarlet fever. The results obtained were practically identical with those in control groups who received the same amount of unmodified toxin as remained in the Veldee preparation, but not the detoxified portion present in his "toxoid." In other words, the presence of large amounts of formaline modified toxin in Veldee's preparation added nothing to its antigenic value.

A discussion of all phases of active immunization against scarlet fever is not in order here. However, a word as to duration of immunity belongs in a discussion of the quantitative features

of immunity. When asked about this question one can honestly reply only that the immunization can, in most instances, be counted upon to last a period of years. Beyond this one cannot safely go in discussing any active immunization. It is well for us to bear in mind that immunity is a relative affair. There are all degrees of susceptibility and immunity. People vary a great deal in their ability to manufacture and retain immune bodies. I have seen a patient with a typical average case of scarlet fever, including desquamation, leave the Contagious Hospital with a positive Dick test, indicating that he was still susceptible, and return to the hospital with a second attack within a month. With the second, his skin test became negative.

The experience of the Scarlet Fever Committee at Mooseheart indicates that about 90% of persons immunized with the full course of injections advised by the Dicks are still immune when tested a year later. On retests during subsequent years, the large majority of these remain immune. Most of those who become again Dick positive after immunization do so within the first year. When these are re-immunized with the same total dosage originally used, they usually retain their immunity as well as the others. Not all workers will obtain results comparable to this. It is important to state that all of these children received the full course of immunizing doses and sixth doses, if their retests two weeks after completing the doses were even slightly positive with two skin test doses. Immunization with less than the full course of toxin will, of course, not produce such lasting immunity. No cases of scarlet fever in originally Dick negative or immunized children have occurred since work was begun at Mooseheart in 1926.

In discussing scarlet fever antitoxin I shall not go into the relative merits of treatment with antitoxin and without. A large enough literature has accumulated on this subject for one to make up his own mind. The Dicks have attempted to anticipate difficulties with the quantitative element here by insisting that the serum be marketed in packages marked prophylactic or therapeutic doses. The present unit of potency used in the laboratories of the United States Public Health Service is 50 times the amount necessary to neutralize one skin test dose of toxin. On the package the dosage appears in these units, and also in original neutralizing units as specified by the Dicks. This leads to confusion. If we remember that one therapeutic dose (300,000 original neutralizing units) is sufficient for the average case of scarlet fever and two for the more toxic cases, there need be little difficulty in deciding on the correct dosage. Only in extremely severe cases will more than two therapeutic doses be required. In my hands, the prophylactic dose of 100,000 neutralizing units has been uniformly successful in preventing scarlet fever, when administered before the onset of the rash. It, of course, confers only a passive immunity which cannot be counted upon to last more than two weeks.

Convalescent serum, if used in large enough amounts, is a very useful prophylactic and therapeutic agent. In persons highly sensitive to horse serum it is, naturally, the agent of choice. One case in which it failed to protect against scarlet fever was described. There are a great many others. One reason is that, until a year or so ago, it was not generally appreciated that the doses in general use were entirely too small. Doctor Gasul and I titrated twelve lots of pooled scarlet fever convalescent serum, kindly furnished to us by the Michael Reese Hospital Serum Center.[15] We found an average titer of about 500 neutralizing units per cc., the highest titer being 1,000 units per cc. This is one-thirtieth the strength of the weakest scarlet fever antitoxin allowed on the market, and one-two hundredth the strength of the best commercial preparation on the market. To gain additional data we gave to each of 20 subjects shown by Dick tests to be susceptible to scarlet fever 10 or 20 cc. of convalescent serum. These persons were Dick tested again the same day or the following day, and Dick tests were repeated daily for several days. Only three became immediately Dick negative. Two of these had very faint original tests. A large proportion, approximately half, had not become Dick negative when the tests were discontinued several days later.

Eleven susceptible children were given a prophylactic dose of scarlet fever antitoxin the same days on which their Dick tests were read as positive. The Dick tests were repeated at the same time the antitoxin was given. Next day *all* had become Dick negative.

To be depended upon for prophylaxis, at least 40 to 50 cc. of pooled convalescent serum should be given. Of course, the antitoxin given with this dose is much less than the amount given in

the ordinary prophylactic dose of commercial antitoxin.

In active treatment of scarlet fever, much larger amounts of convalescent serum need to be given to obtain results comparable to those obtained with antitoxin.

Diphtheria. The quantitative element in diphtheria immunity needs equal emphasis. The Schick test is a reliable indicator of immunity against diphtheria, if properly performed and properly interpreted. Unmodified toxin is used, so diluted that 0.1 cc. contains 1/3 to 1/50 of a minimum lethal dose for a 250 gm. guinea pig. It is best to observe the reaction at 48 and 72 hours. If observed sooner than at 48 hours, some negative tests will be interpreted as positive. If read later than 72 hours, some positive tests will already have faded. A control test with boiled Schick test material should always be made. In practice, however, it is probably safest to disregard a positive control test, or pseudo-reaction, when it occurs with a positive *original* test. It will be found that in many instances these reactions to heated toxin will have become negative after a series of immunizing doses. If in the *retest* following an adequate immunizing course the Schick test control results in an area of erythema as wide, as bright, and as indurated as the test with the unheated toxin, it is probably safe to call the test negative. Far too many mistakes are made in interpreting the Schick reaction as pseudo-negative. Another cause of error, less easily controlled, is the presence on the market of occasional batches of impotent Schick test material.[12] In 1929 two Cook County Hospital nurses of a group of 165, who had had negative original Schick tests, came down with diphtheria. In the course of an investigation to find the cause of these mistakes, I tested nine different preparations of Schick test material simultaneously on several susceptible persons. Two of the commercial preparations gave negative tests in all persons tested, while all the others uniformly resulted in positive tests. It happened that one of these impotent preparations was by the same manufacturer whose product had been used in testing the nurses who contracted diphtheria. At present, the Scarlet Fever Committee, which immunizes the Cook County nurses against both scarlet fever and diphtheria, is using for Schick tests only toxin made by themselves and diluted the day used. Probably the already diluted and buffered Schick test material made now by some biological concerns is potent in most instances.

Shaughnessy[16] of the Illinois State Health Department recently cited work which raises the question as to whether the present Schick test material, even if it meets United States government requirements, is strong enough. In years past a negative Schick test was thought to indicate that the person in question had enough circulating diphtheria antitoxin to enable him to withstand the invasion of all diphtheria bacilli. Schick's original assertion was that this "critical threshold" of antitoxin in the blood was 1/30 unit per cc. Later he modified this statement by saying that if an individual had less than 1/500 unit of antitoxin per cc. in his blood the test was always positive, if more than 1/200 unit per cc. it was nearly always negative. Recent studies of Jensen, Parish, and Wright indicate that this level is approximately correct but they question whether this amount of antitoxin is enough to protect all persons against diphtheria. The same workers showed that with Schick test toxin ten times the strength of that usually used a negative result ensued only if the blood contained 1/30 unit or more of antitoxin per cc.

Even more disturbing is the demonstration by other English investigators at Leeds that when persons become infected with a particularly virulent type of diphtheria bacillus called by them the "gravis" type, an even higher titer of circulating antitoxin is required to protect them. Several persons with negative Schick tests whose blood contained as much as 1/5 unit per cc. contracted the disease, though none died.

No one can fairly question the enormous value of the Schick test in differentiating those susceptible and those immune to the onslaughts of the average strain of diphtheria bacilli. But it appears that a more critical evaluation of Schick tests from the quantitative point of view is needed.

Since its introduction by von Behring in 1912, active immunization against diphtheria has come into almost universal use in this country. Until 1925 toxin-antitoxin mixtures were used almost exclusively. In these the mixtures were so diluted that 1 cc. contained 3 L+ doses of toxin to which antitoxin had been added. Some contained enough antitoxin to almost but not quite completely neutralize the toxin; other mixtures were neutral; and others, slightly over neutralized.

While no claims of 100% effectiveness were made, toxin-antitoxin cut down the incidence of diphtheria very materially in those immunized. Park[17] reported that among 57,000 originally Schick negative children there were five cases of diphtheria; and among 33,000 originally Schick positive children who received one to three doses of toxin-antitoxin, there were nine cases of diphtheria—a total of 14 cases of diphtheria among 90,000 originally Schick negative or immunized subjects. On the other hand, among 90,000 untreated control subjects there were 56 cases of diphtheria. About four times as many cases of diphtheria developed among the unprotected children.

Following some fatal accidents with frozen preparations of toxin-antitoxin, the old dosage of 3 L+ doses of toxin per cc. was supplanted by 0.1 L+ doses of toxin per cc. in the commercial toxin-antitoxin mixtures. I do not have figures on large groups immunized since that time. My personal experience would indicate that for one reason or another, toxin-antitoxin has probably been less effective since 1924.[1] (As previously stated, there were 29 cases of diphtheria among the Cook County Hospital nurses during a period of 17 months in 1926 and 1927. Fourteen of these were nurses who had had three doses of toxin-antitoxin, as recommended by the state board of health at that time. Since the control group who had not had toxin-antitoxin was more than twice as large as the group of those who had and since the number of cases of diphtheria in it was practically the same, it is evident that the percentage of cases in those supposedly immunized was greater than in those not immunized.) To get additional data, Schick tests were performed on the entire nursing staff. To my surprise the percentage of positive Schick tests among those who had had three doses of toxin-antitoxin was 67.2, while that in the untreated group was 58.3%. It became apparent that toxin-antitoxin, as it was then being administered, was not an effective procedure.

Thirteen lots of toxin-antitoxin prepared by four different biological houses were obtained, and the tests for potency specified by the laboratory of the United States Public Health Service were repeated upon them. No lot was found to be of the "ideal toxicity" described in the government tests, but ten were within the "permissable variations" specified. Three lots, none of which were outdated, were definitely less potent than the regulations required. The use of impotent material may have been the cause of the poor results obtained, but in the light of subsequent experience it seems more likely that three doses of toxin-antitoxin in the dosage now used is insufficient for most adults.

Beginning in 1927 five doses of toxin-antitoxin, every lot of which was tested by the Scarlet Fever Committee, were used instead of three. One dose of 0.5 cc. and four doses of 1.0 cc. each were given at weekly intervals. Of 141 susceptible nurses receiving this course of treatment up to July 1, 1930, 64.4% of those retested were found immune. Three of the group receiving five doses of toxin-antitoxin contracted diphtheria.

After a few months it was decided to use diphtheria toxoid. A total quantity of at least 2.5 cc., divided among three or more doses, was used. If a nurse had a large and bright control test indicating, in addition to a high susceptibility to diphtheria, sensitiveness to the proteins of the toxin, she was given five doses at weekly intervals, as follows: 0.1 cc., 0.25 cc., 0.5 cc., 1.0 cc., and 1.5 cc. If the Schick test was only moderately large and the control test negative, larger initial doses were used. Four hundred twenty-four nurses received this course of treatment. Of those retested, 8.14% were immune. One of this group subsequently had a mild attack of diphtheria. In the same period there were 16 cases of diphtheria among 357 nurses who had been neither tested nor immunized by us. Since this study only toxoid has been used, and to my knowledge there have been no cases of diphtheria in those immunized to the point of a negative Schick test.

I think there can be no question that diphtheria toxoid is superior to toxin-antitoxin as an immunizing agent. The experiences cited by Healy[18] indicate, however, that no American commercial preparation is as effective as the toxoid obtained directly from Ramon in France. In private practice I always give at least twice the dosage recommended in the commercial packages, that is, four doses of 0.5, 1.0, 1.5, and 1.5 cc. at weekly intervals. A smaller total dose will render the majority of susceptible children Schick negative. From previous experience I have confidence in a lasting immunity being produced only if larger doses than are now in general use are given.

In a recent study in Toronto,[19] McKinnon and Ross compared the relative effectiveness of im-

munizing courses of 1 cc., 2 cc., and 3 cc., each of toxoid in protecting children during a diphtheria epidemic. The case incidence and death rate were estimated from a large group of non-treated controls. In the group who received only one dose of toxoid there were 24 cases instead of the 34 cases estimated, and 3 deaths. In the group receiving two doses there were 52 cases instead of the 200 which had been estimated, and 2 deaths. In the latter group about 90% were protected, and subsequent Schick test studies indicated that this percentage of protection was maintained for at least four or five years. Here again it is well to reiterate that immunity is always a relative affair and not absolute. The statement appearing in good textbooks that active immunity against diphtheria will last six years (this statement, quoting Park and Zingher, appears in Kolmer's text) is open to serious question. It is safer to tell parents that after a negative Schick test is attained through toxoid administration immunity can *usually* be counted on to last several years. Retests should be made every two years.

I have not used alum toxoid, so cannot speak with authority about it. It has not been in general use long enough for an adequate evaluation of its effectiveness. There have been some sloughs at the site of injection.

Fraser[20] of Toronto, on good experimental grounds, holds that one dose of alum precipitated toxoid is definitely inferior to three doses of unmodified toxoid in producing immunity against diphtheria. He used a single batch of formolized diphtheria toxin, dividing it into two portions, one of which was prepared as the alum precipitate. One group of children received three doses of unmodified toxoid. The others received an equivalent amount of toxoid as the alum precipitate in a single dose. Ten weeks after the last dose in each group, the anti-toxin in the blood of the two groups was found to be over 0.01 unit per cc. in 62% receiving the alum precipitate and in 91% receiving unmodified toxoid. One year later similar tritrations were made, and only 19% of the alum precipitate group still had 0.01 unit per cc., while the percentage in the other group was still 91%.

I do not propose to discuss the active treatment of diphtheria beyond saying that the present tendency is toward larger and larger doses of antitoxin. Large amounts of serum will produce slightly more late serum sickness than small amounts, but the danger of anaphylactic shock from the initial injections is probably no greater. In my own cases I give approximately twice the dosage recommended in the texts of Kolmer and Schamberg.

Dr. Sauer will speak to you about whooping cough. There is no question that the vaccine prepared and administered according to his directions gives a far higher degree of protection than the vaccines formerly used. As I understand it, in addition to the use of freshly isolated pertussis strains in the smooth, hemolytic phase, he insists that the total dosage be, at least, 80 billion killed bacilli. This is twenty times the dose formerly used—another recognition of the importance of the quantitative factor.

In closing, let me reiterate that there is a quantitative element in immunity which cannot be neglected. Care in selection of the biological to be used and care properly to fit it to the patient in question are of the utmost importance.

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TYPE-SPECIFIC ANTI-PNEUMOCOCCIC SERUM THERAPY

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During a period of 20 years since Cole first saw the beneficial results of type specific serum in lobar pneumonia, the treatment has been tested wherever the serum was abailable in hospitals in New York, in Boston, in England, in Scotland, and most recently in Cincinnati. It has also been used for patients in their homes in the state of Massachusetts. Two years ago I compared the data on antipneumococcus serum with the data that has been used to justify the use of other forms of therapy in pneumonia and other diseases.[1] It appears that no therapy that is offered to physicians today has been so thoroughly tested as antipneumococcus serum therapy.

The results of some of these studies of type specific therapy for Type I pneumococcus lobar pneumonia and Type II pneumococcus lobar pneumonia can be shown with the aid of tables and figures.

The first three illustrations are concerned with Type I lobar pneumonia. They include only cases diagnosed within the first 72 to 120 hours. In the first 2 lines of table I the fatality rates of patients treated in New York at Bellevue Hospital, and in various city hospitals in England and in Scotland by the British Therapeutic Trials Committee are compared with an approximately equal number of controls chosen by the system of assigning numbers on admission. Every second patient in these series was given serum therapy. The fatality rates were reduced in each series; by as much as 50% in one. In the Boston City Hospital, where the class of patient is similar to these other hospitals, every patient in

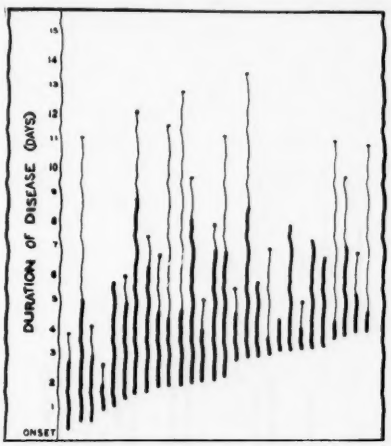

Fig. 1. Type 1 cases. Duration of disease in 28 cases that received no serum.

certain wards was treated, and a similar low death rate of 12% was obtained. For comparison it is generally thought that the death rate of cases seen early in their disease who do not receive specific therapy, is about 25%. In this

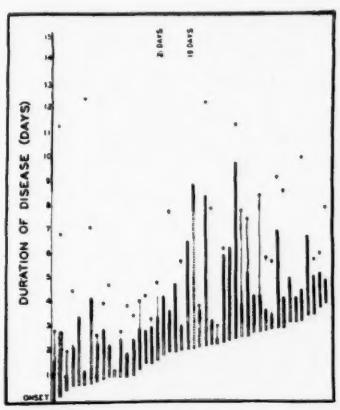

Fig. 2. Type 1 cases. Duration of disease in 46 serum treated cases. In Figures 1 and 2 each bar represents one patient. The distance of the bar from the base line represents the duration of the disease before entry; the hatched portion the time from admission to the time of serum administration; the solid portion the time to the first permanent drop in temperature below 101° F; and the light line the time until all symptoms and fever disappeared.

connection it is of interest that in Massachusetts where patients were treated in their homes, the death rate was the same as in hospitals. A series of Type I patients diagnosed early in their

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disease showed a death rate of about 10% among those that received serum and a death date of 25% among those who did not receive serum.

The first figure indicates the duration of the disease in 28 patients. The time in days is shown at the left. The space from the baseline to the beginning of the heavy line indicates the duration of symptoms in each case before admission to the hospital. The length of the heavy line indicates the time from admission to the hospital until a

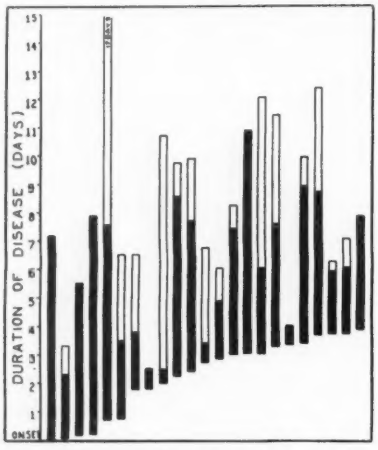

Fig. 3. Type II cases. Duration of disease in 23 cases that received no serum.

decisive change took place in the course of the disease, and the length of the light line is the time during which mild fever persisted.

The second figure shows the duration of the disease in 46 patients who recovered after receiving serum therapy.

A smaller number of cases of Type II pneumococcus lobar pneumonia has been similarly treated. Data like that for Type I pneumonia is available where enough serum has been administered early enough in the disease. Table 2 and figure 3 (23 cases), and figure 4 (33 cases) show the death rates and duration of the disease in patients that received serum compared with patients that did not receive serum.

A summary of the therapeutic tests conducted to date with antopneumocoicic serum shows that all physicians who have diagnosed and treated patients early and have given what is known to be an adequate dosage, have had strikingly favorable results. The results compare with those attained by the same means, namely alternate case therapeutic experiments with diphtheria antitoxin. (Table 3.)

It is now generally agreed that type specific therapy of Type I lobar pneumonia patients befor the end of the 4th day of the disease will reduce the death rate by one-half, and will shorten the course of the disease in a striking manner in cases that recover. Seventy to 80% of these are well within 36 hours after receiving serum. The best results reported to date are those of Blankenhorn in Cincinnati who treated 50 patients without a single death.

Type II pneumonia is a more serious disease; more serum is required, and good results have been obtained by fewer observers, but where the fundamental requirements of adequate dosage and early treatment have been well observed the results have been as good as in Type I pneumonia.

Type specific serum has developed and become established, but this development has not stopped. Investigation continues, and two new probabilities of extensions of its usefulness have appeared, namely its use for other types of pneumococci than Types I and II. Table 4 indicates the

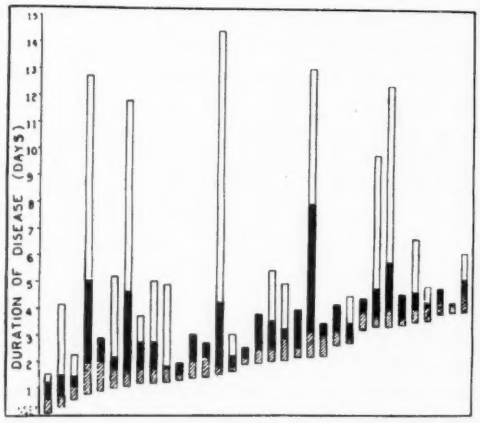

Fig. 4. Type II cases. Duration of disease in 33 serum treated cases. In Figures 3 and 4 each bar represents one patient. The distance of the bar from the base line represents the duration of the disease before entry; the hatched portion the time from admission to the time of serum administration; the solid portion the time to the first permanent drop in temperature below 101° F.; and the light portion the time until all symptoms and fever disappeared.

mortality rate of pneumonia due to the rarer pneumococcus strains when type specific serum is used for therapy. Types V, VII, VIII, and XIV. Type XIV is found, you will note, predominantly in children. Another even more important development in this field is the probability that serum obtained from rabbits will prove cheaper and more effective than horse serum. The rabbit

TABLE 1. TYPE I, EARLY CASES, MAXIMUM DURATION 72 TO 120 HOURS

		Treated		*Controls*	
		Per Cent Died	Number of Cases	Per Cent Died	Number of Cases
Bellevue	72 Hrs.	11.7	103	26.8	97
Britain	120 Hrs.	11.2	107	16.1	105
Boston City	96 Hrs.	12.0	58		
Fatality Rate Generally Reported 25.0 Per Cent					

TABLE 2. TYPE II, EARLY CASES, MAXIMUM DURATION 72 TO 120 HOURS

		Treated		*Controls*	
		Per Cent Died	Number of Cases	Per Cent Died	Number of Cases
Bellevue	72 Hrs.	14.3	21	65.0	20
Britain	120 Hrs.	12.5	56	22.2	54
Boston City	96 Hrs.	17.0	41		
Fatality Rate Generally Reported 40.0 Per Cent					

develops more potent antibodies, is cheaper to use, and lends itself better to the production of serum for a large number of different strains of pneumococci. If such serum proves as practical as the first reports indicate, nearly all our problems are already solved.

The questions that have been raised about serum administration have usually had nothing to do with its effectiveness. They are of a more practical nature. The first of these is, "What is the technique of its safe administration?" In regard to the technique of administration I shall refer you to a handy little book by Lord and Heffron.[2] This book is an outgrowth of the experience of 20 years with type specific serum therapy of pneumonia in hospitals. It discusses the subject thoroughly from all angles and gives a workable description of the technique that was found useful when applied to pneumonia cases wherever found in homes and hospitals throughout a populous state. I can endorse the subject matter, and recommend it for its readability. You will find that early diagnosis is of prime importance. Lobar pneumonia is certainly much easier to diagnose in the first 2 to 4 days of the disease than ony of the other diseases where such early diagnosis is important. The recognition of the organism that is causing the pneumonia is a second important fact. Typing of the pneumococcus from the sputum by means of the Neufeld reaction is rapid, accurate, and requires no apparatus other than a slide and microscope. The dosage of serum and the precautions taken to avoid reactions are well presented in the book of Lord and Heffron, and they can be found in the wrapper that comes with each vial of serum. Diagnosis, before the end of the 4th day, typing of the pneumococcus from the sputum, and the administration of an adequate amount of antipneumococcic antibodies have been made feasible and safe.

TABLE 3. MORTALITY RATE OF DIPHTHERIA CASES TREATED WITH ANTITOXIN COMPARED WITH CASES TREATED WITHOUT ANTITOXIN

	With Antitoxin		*Wihout Antitoxin*	
	Percent Died	Number of Cases	Percent Died	Number of Cases
Where treated				
New York	15.0	56,425	34.9	27,210
Paris	24.5	448	60.0	520
Berlin	16.7	317	43.1	260
Copenhagen	3.5	239	12.5	245

TABLE 4. EARLY TREATED CASES WITHOUT CONTROLS

Type	Percent Died	Number of Cases
Type	Percent Died	Number of Cases
V	9.6	93
VII	6.3	47
VIII	8.8	47
XIV	7.1	28 (children)

A second question that has often been asked is "How can this measure, which has heretofore been confined to places where money is available to finance its use, be made available to others?" Probably the most serious misconception about the use of antipneumococcic serum is the impression that seems quite widespread that its cost precludes its use. Serum is now commercially available for Types I, II, V, VII and VIII at a price which is not out of reach of many persons in the community, namely from $25 to $100 per patient. When one considers the price of medical care for many other diseases of the same or equal seriousness and frequency—tuberculosis, appendicitis, and the value which the patient receives in return for expensive treatment, those who can afford specific therapy for lobar pneumonia are well advised to do so. The problem of its distribution to those who cannot afford to pay may be solved as it is being solved for medical care of other kinds. Hospitals should include provision for serum therapy in their budgets as is done in Chicago, Evanston, Milwaukee and Cincinnati. Another procedure that may work out well is that of Massachusetts, where the state itself manufactures serum and supplies its own physicians and those in other New England States. The state has also aided in the training of physicians and laboratory diagnosticians. Similar projects are being undertaken in New York State and in New York City where adequate funds have been appropriated for pneumonia control. The Illinois Medical Society may profitably interest itself in

promoting the development of pneumonia serum therapy in this state. The activities of the members of this Society in their own communities could do much to induce laboratories to open typing service stations and to induce hospitals to furnish serum for those who cannot pay. An official suggestion from the Society to the State and City Health Departments and the Legislature would insure the organization of adequate pneumonia control.

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HUMAN CONVALESCENT SERUM AND ITS APPLICATION TO ACUTE INFECTIOUS DISEASES

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The realization of the necessity for a serum center to make human convalescent serum available to any community is becoming so well recognized that within the last few years six or eight such organizations have been established, and several others are being planned. The success of such an organization requires intimate cooperation by the established health organizations, organized medical groups and the practicing physicians.

The Samuel Deutsch Serum Center has been fortunate in having received wholehearted cooperation from the Chicago Board of Health, the Illinois State Department of Health and the physicians in the community. The extent to which the serum center has been able to make human convalescent serum available to our community must be attributed to the active support of these groups. The Samuel Deutsch Serum Center is particularly indebted to Dr. Herman N. Bundesen, President of the Chicago Board of Health, Dr. Frank J. Jirka, Director of the State Department of Health, for their vital interest and help, and to Dr. Julius H. Hess for his unfailing advice and guidance since the serum center has been established.

We constantly strive for two goals in the preparation of human convalescent serum: first, to secure maximum potency, and second, to insure an innocuous product.

There are several measures that we must follow to achieve the first purpose. We must have every assurance that the individual who is to act as a donor of blood for serum has had an attack of the specific infection for which the serum is prepared. Individuals having doubtful cases should not be used. The blood must be drawn within six months following an attack of scarlet fever or measles, because after this period of time the serum loses a measure of its potency. This is not true in individuals recovered from infantile paralysis. Their serum apparently remains potent for many years after an attack of the disease. If at all possible, every pool of serum should contain a minimum of thirty individual specimens. During the processing of the serum, it must at no time be permitted to become unduly warm, and after preparation it must be stored in a refrigerator at 2 degrees Centigrade.

We have had experience in the past with serum prepared from doubtful cases, serum prepared from individuals who had their illness more than six months prior to the drawing of blood, and serum inadvertently exposed to warm temperatures for several hours. In all cases, there is very distinct evidence that such serums had a markedly reduced efficacy.

Certain measures must be followed in order to prepare a product which may be given with a feeling of security. All glassware used in the drawing of blood and processing of serum must be absolutely chemically clean and sterile. Every specimen of blood must have both Wassermann and Kahn tests, and a careful sterility test before it may be used for pooling. The pool of serum, to which a preservative is added as a precautionary measure, should be put through a Berkefeld Filter, and the final pool must again be tested for sterility before it is released.

Obviously, these fundamental but rigorous requirements, developed during the last six years, are reflected in the clinical results and in the complete safety of administration of human convalescent serum.

The expectancy and nature of reactions from

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From the Samuel Deutsch Serum Center, Michael Reese Hospital, Chicago.

the use of human serum should first be discussed. When properly prepared, following the principles outlined in the first part of this paper, severe reactions, either immediate or delayed, need not be expected; for in a vast experience in Chicago such reactions have not been encountered. An occasional severe reaction has been traced to glassware improperly prepared or to serum improperly handled. We have encountered very infrequently (in 0.3 to 0.4% of cases) mild urticarial reactions. This is being studied, and at the present time all evidence seems to indicate that this mild urticaria is due to a passive sensitization. Because it is so mild in character, and because this passive sensitization is short in duration, it requires very little consideration in the administration of human serum.

The limited space of time allotted to this paper curtails any detailed discussion of the use of serum and the entire scope of serum prophylaxis and therapy. We will not have time to touch upon our experience with the use of serum in chickenpox, whopping cough, mumps, dysentery and pneumonia. Only the results secured with the use of serum in scarlet fever, measles and poliomyelitis can be discussed.

Scarlet Fever. Scarlet fever convalescent serum has now been used for prophylaxis and therapy in a large number of cases. Ninety-seven and seven-tenths per cent. of home contacts, who had no previous scarlet fever and were intimately exposed, did not develop the disease after receiving a prophylactic injection of serum. The immunity conferred by this injection is only temporary, and although from some reports it may last one or two months, we have found that at times it may not persist more than two weeks. For this reason we recommend repeating the inoculation at the end of two weeks in a susceptible individual if he remains constantly exposed to the infection for longer than this period.

The results secured with the use of serum in the treatment of scarlet fever are now well established. When administered early and in adequate dosage, it produces a rather prompt amelioration of the acute symptoms of the disease. This is particularly true when the serum is administered intravenously. Over 90% of patients will have a drop in temperature, decrease in toxicity, fading of the rash and improvement of the throat symptoms within 12 to 48 hours. The rapidity of the improvement depends not only on the duration of illness, but also upon the amount of serum administered and the route employed.

Our studies have also brought out the very interesting fact that the incidence of complications in those individuals who received serum is much less than in untreated cases. It is not surprising, therefore, that the mortality in the serum treated group is decidedly lower than the mortality observed in untreated patients.

Convalescent scarlet fever serum has been used rather extensively late in the disease in scarlet fever patients suffering from severe complications. It has also been employed in many instances of fulminating infections produced by the hemolytic streptococcus. In these infections, very massive doses, administered intravenously and repeated at frequent intervals, have been found necessary. The results secured, as indicated by the reports made to the Serum Center, show that the serum is of marked beneficial effect in most instances, although these results are not as striking nor as prompt as is seen in the treatment of uncomplicated scarlet fever.

Measles. Measles convalescent serum has been limited to prophylactic administration. It has been found that when a proper dose is given within four days after exposure, most of the cases are completely protected and no disease develops. However, if the serum is administered from the fourth to the eighth day of the incubation period, in most instances a very mild atypical measles will appear. This type of disease is called sero-attenuated measles. Our results have shown a combined protection (either complete or partial) in 94% of contacts immunized with serum.

If complete protection is conferred upon the individual with the administration of convalescent serum, this protection is only transient because it is a passive immunity. However, if an attenuated form of the disease develops, it is an active immunity and may be expected to be permanent. In institutions, where all contagious disease is avoided, immediate administration is practiced to obtain complete protection; whereas, in the home, where an active immunity is more desirable, delayed administration is recommended.

Poliomyelitis. The results secured in the Chicago area last year with intensive therapy confirm our previous satisfactory experience. Fifty-three patients were treated in the preparalytic stage during 1936. A number developed a mild grade

of paralysis. Only one developed a more serious degree of involvement. This patient was really beginning to show evidence of paralysis when serum was given her, the interne on the case having noted definite weakness in his examination, but even in this patient recovery has been quite marked, and the amount of residual involvement will not be sufficient to keep this person from resuming an active life before the year is up. The right middle and lower trapezius are the only muscles which are now considered seriously affected. The other 52 patients have made a practically complete recovery, either immediate or within a few months of the onset of the illness.

The mortality rate secured in bulbar cases is also quite significant. The average mortality in this fulminating form of the disease is reported to be around 70%. The serum treated group, which now numbers 76 patients, has an average mortality of only 42%, the rate being only 32% in those who were treated within 24 hours of the first appearance of paralysis.

These unquestionably favorable results are attributed to our method of treatment. Early diagnosis, before any paralysis is manifest, must be stressed. Massive amounts of serum are employed without delay, the dose varying between 100 cc. and 200 cc. The cases are closely observed, and the same massive doses of serum are repeated within 12 to 24 hours unless and until there is a cessation of the active infection as determined by temperature drop, decrease in prostration and arrest of the disease progress. All serum is given intravenously—the intraspinal route apparently has no advantages and in bulbar cases may even be hazardous. It is to be understood, of course, that other measures must be observed, complete rest, proper muscle care, etc.

Although these results as well as other reports are very favorable, nevertheless, convalescent serum treatment in poliomyelitis has remained the subject of much discussion. There are three schools of thought at the present time. One group is firmly convinced that the use of serum is a very beneficial measure and to withhold serum from any case that requires it is an injustice to the patient.

A second group, comprising a majority of medical opinion, adopts a stand which may best be expressed as follows: Clinically, patients treated with convalescent serum seem to have a very definite response to such therapy. The favorable reports cannot be ignored. Since there is no other therapeutic measure, and since convalescent serum is harmless, the patient should be given serum for the possible or probable beneficial effect it may exert upon the course of the disease. However, the lack of any carefully controlled study, which shows a distinct advantage in the favor of serum treated cases, prevents this group of physicians from accepting this measure as one of undisputed value.

A third group adopts a more extreme and more critical attitude. This group is completely unimpressed by favorable observations, because of the knowledge that 50 to 80% of individuals who develop symptoms of early poliomyelitis will recover without paralysis. This group maintains its attitude, despite recent reports of less than 2% paralysis appearing in patients treated with massive doses of serum in an early stage of the disease before paralysis was manifest. They refuse to accept this very marked and significant difference of incidence in paralysis of less than 2% in treated patients, against 20% or more incidence of paralysis in untreated, well studied patients, as reported in the American literature up to the present time. A critical attitude of this kind is healthy if it is not arbitrary. However, a certain proportion of this group bitterly opposes and condemns serum therapy. They consider the matter a closed subject and such therapeutic attempts hopeless.

This view that treatment is hopeless inevitably leads to late diagnosis. There is the natural reaction that since early diagnosis offers no advantage, then there is no need for any watchfulness to recognize the disease in its early stages. An apathy toward early diagnosis will defeat efforts of studying the nature of this illness in man, or of controlling the spread of infection. It is for these reasons, quite apart from the question of serum therapy, that this negativistic attitude should be deplored.

The controversy on the value of convalescent serum therapy cannot be definitely settled until a well controlled, impartially observed alternate case study in a large series of cases is made. The statement made before this Society last year may be repeated: "The obligation rests with those who deny the value of convalescent serum (in poliomyelitis) to perform a study of this kind to validate their contention. We who believe in the value of convalescent serum therapy cannot as-

sume the responsibility of denying such therapy to any patient."

CONCLUSIONS

1. The success of a serum center depends on wholehearted and intimate cooperation with established health organizations and medical groups.

2. Rigorous care and attention must be exercised in the preparation of convalescent serum to insure a final potent and safe product.

3. Scarlet fever convalescent serum has been effective both in prophylaxis and therapy.

4. Measles convalescent serum has proven to be a valuable prophylactic agent.

5. The treatment of poliomyelitis with convalescent serum has resulted in less than 2% paralysis in over 200 consecutive cases. Important features of the treatment are:

a. Early diagnosis and early serum administration.

b. Massive doses by the intravenous route.

c. Constant close observation of the patient and repeated administration of serum every twelve hours until the active disease is arrested.

6. Despite adverse opinion on the value of serum therapy in poliomyelitis, studies of this form of therapy should be continued and, if possible, enlarged to include an alternate case control group.

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ROENTGEN THERAPY IN INFLAMMATORY AND INFECTIOUS LESIONS

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So much emphasis has been placed upon the use of irradiation in the treatment of malignancy and other neoplasms that many physicians may not be aware that most acute and chronic infections and inflammations respond very favorably to this same form of therapy. The fear of skin reactions as seen in the treatment of malignancy may be partially responsible for its limited use.

Although the almost specific action of roentgen rays upon many types of infection has been known to radiologists for a number of years, the use of this therapeutic agent has been limited to certain localities and only a few of the infections which respond most favorably have been treated. The work and publications of Desjardins, Manges and Hodges have done a great deal to place this type of therapy in infections and inflammations upon a rational and scientific basis. Still, only a small percentage of such lesions that respond so favorably to roentgen rays are so difficult to treat by other methods in common usage receive roentgen therapy. Its wider usage has been prevented by the fear of skin reactions and the physician's unfamiliarity with the biological effects and reactions of irradiation. Many of these biological actions have been known by workers and experimenters with roentgen rays and rays given off by radium since as early as 1905. They discovered these reactions in themselves or their patients ofttimes much to their own sorrow. From these experiences there grew an empirical system or method of therapy.

In order to have a rational method of treatment it is necessary to be able to measure the dosage of the agent used and know the biological reaction to various dosages. In the early years of roentgen therapy no measuring instruments of dosage were available, hence, it has been necessary to wait upon the physicists and manufacturers for the development and perfection of instruments with which to determine the exact dosage delivered by any source of radiation. Next came the determination of the reaction of living tissues to measured doses. This has taken time, a tremendous amount of work and is not yet complete as many of the phases are still in a theoretical form and will not be definitely known until much more progress has been made in the knowledge of electrophysics.

According to Desjardins[1] cells may be classified in the order of their degree of sensitivity as follows:

Lymphoid cells—lymphocytes found in the spleen, lymph nodes, blood, bone marrow, thymus and tonsils.

Polymorphonuclear leukocytes found in the blood or tissues.

Epithelial cells found in certain secretory glands, basal epithelium of the testes and ovary, basal epithelium of the skin and mucous membranes, alveolar epithelium of the lungs, bile ducts and liver and epithelium of tubules of the kidneys.

Endothelial cells of blood vessels, pleura and peritoneum.

Connective tissue cells.

Muscle cells.

Bone cells.

Fat cells.

Nerve cells.

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The younger and more active the cell the more susceptible it is to the influence of radiation, but the relation of the age of the cell to its relative sensitiveness is less important than the specific vulnerability of the different varieties of cells.

Early in the application of roentgen rays for therapeutic purposes it was felt that the beneficial effects of radiation might be due to a stimulating effect of the radiation, this stimulating action causing an increase in tissue vitality sufficient to successfully combat the pathological process. One reason for the advance of this theory has been that regression of pathological lesions has taken place after exposure to small doses of roentgen rays. This is probably better explained as being due to a high degree of radiosensitivity of the tissue cells involved. Desjardins feels that the theory regarding the stimulating effect of radiation has arisen from the attempt to apply to radiation the so-called Arndt-Schulz law according to which small doses stimulate and large doses depress cellular metabolism. Based on pharmacologic grounds this doctrine has not been generally accepted even by pharmacologists. The attempt to apply this law to the action of roentgen rays is unwarranted because the experimental evidence on which it is based is extremely meager and apparently invalid. Experimental work on glandular tissue such as the salivary and gastric glands, also experiments on the effects of radiation on the secretory activity of the kidney show a very transient increase of secretory activity in response to radiation. The phase of increase in glandular function is of such a short duration and so quickly replaced by a decrease in glandular activity below normal that we may feel that any apparent stimulating effect associated with the application of radiation is but the alteration of a normal to an aberrant function due to irritation. Secondary and indirect stimulation may sometimes be observed as the result of a primary degenerative effect on certain cells.

At the present time we believe that the first biological effect of radiation is irritation. This irritation may lead to a temporary transient phase of increased cellular activity. This is followed almost immediately by depressed functions and cellular destruction. Continued acceleration of metabolism cannot be produced by radiation. Degenerative changes practically always follow except in extremely resistant tissue where no effect whatever may be observed.

While the empirical treatment of infection and inflammation by irradiation has grown along with the treatment of other lesions it has not attained the usage it deserves partially because of the inability to explain the reactions obtained. The most logical explanation of the excellent results and rapid improvement following roentgen therapy in infections and inflammations is given by Desjardins. The body's method of fighting an infection is to rush to the site large numbers of leukocytes which have the power to ingest and digest the invading organisms. The antibodies produced by these cells are entirely endogenous and not exogenous, hence, only those organisms ingested by the cells are effected by them, leaving all other organisms free to grow, reproduce and excrete toxins. No free antibodies are present in the tissues until the leukocytes begin to die and break up as the result of infection, except for small quantities that may be present in the blood and lymph, the result of some previous infection. These, however, are always in small quantities and not sufficient to greatly retard the process of a virulent infection. Only after large numbers of leukocytes have been destroyed does the concentration of antibodies become sufficient to retard the growth, reproduction and excretion of the invading organisms sufficiently that they may be overcome. It is this destruction of leukocytes and liberation of antibodies we seek to cause by irradiation.

Due to the marked susceptibility of leukocytes and particularly lymphocytes as brought out by Warthin[2] degenerative changes are noted as early as 15 minutes following a moderately large exposure to roentgen rays. With a proper regulation of dosage the leukocytes may be the only cells in an area destroyed by irradiation. The rapid destruction of leukocytes by radiation in an infected area frees large quantities of antibodies at the site of infection retarding growth, excretion of toxins and killing invading organisms. The lysins also contained in these cells promote rapid liquefaction and drainage of tissues too badly injured for repair. If treated early, however, such injury does not occur and the tissues quickly return to normal. Only in advanced or long standing cases are incision and drainage necessary and when preceded by irradiation the convalescence should be shortened due to the rapid liquefaction of injured or necrotic tissue.

If we accept Desjardins' theory and we feel that it is the most logical then dosage is of ex-

treme importance. Considerable has been written and there has been some controversy over the proper dosage. Doses varying from 75 r daily up to 350 r repeated in 48 hours have been advocated and good results reported. Inasmuch as the prime object, according to our accepted theory, is to destroy large numbers of leukocytes in the infected area the larger doses, consistent with the limits of safety, should give the most prompt and uniform results. The essayists have found this to be the case except in certain types of infections where the effects of roentgen rays desired are not confined to the destruction of leukocytes.

During the period of experimentation and statistical research practically all kinds of infections and inflammations have been treated with irradiation. The results up to the present time show that certain kinds of infections are particularly susceptible and in some instances, notable furuncles, carbuncles, metastatic parotitis, erysipelas, "Ludwig's" angina and other infections originating in and about the mouth there is almost a specific response. All types of infections and inflammations may be grouped according to their acuteness, response to irradiation, type and dosage giving best results. (Charts 1, 2 and 3.)

The acute infections are the most susceptible and react best to large doses of lightly filtered radiation. The entire dose of 600 r to 700 r is given within 48 hours. The chronic infections are less susceptible and require repeated administration of smaller doses, moderately filtered, given over an extended period of time. The last group of inflammations respond best to highly filtered fractional dosage given over an extended period.

The course and results also follow this grouping. In the acute group, following the first dose a definite reaction in the form of an exacerbation of symptoms usually occurs within from four to eight hours which lasts from six to eight hours. This is followed by rapid amelioration of the symptoms and disappearance of the lesion. This is often so rapid as to eliminate the necessity of the second dose usually given in 48 hours. Where the recovery is not so rapid and a second dose is indicated the exacerbation of symptoms is a rare occurrence, the lesion continues to improve to complete disappearance. Pain, discomfort and swelling are relieved in the order given. The period of convalescence in nearly all cases is markedly shortened, being from two to five days.

In the group of chronic infections the course covers a much longer period. The dosage being much smaller, little or no exacerbation of symptoms occurs and the response is correspondingly slower. This group requires treatment over a period of from four to twelve weeks and complete recovery of some of these lesions cannot be expected under from three to six months. The re-

CHART 1. ACUTE INFECTIONS.

Cellulitis Ludwig's angina Furuncles Carbuncles Metastatic Parotitis Erysipelas Acute adenitis Lichen planus acute Impetigo contagiosa Gas gangrene	Highly sensitive to irradiation. Respond best to comparatively large doses.

CHART 2. CHRONIC INFECTIONS

Chronic adenitis (Tbc., Pyogenic) Mycoses Perionychium Chronic parotitis Lichen planus chronic Lupus Acne	Moderately sensitive to irradiation. Respond best to fractional doses, moderately filtered.

CHART 3. INFLAMMATIONS

Bursitis Pruritis Neuritis (Herpes zoster, Sciatica, Radiculitis, Brachial)	Moderately sensitive to irradiation. Respond best to fractional highly filtered doses.

CHART 4

Lesion	Improved	Question-able	Not Improved	Total
Neuritis	16	..	3	19
Cellulitis	87	2	2	91
Bursitis	5	..	..	5
Carbuncle	25	..	1	26
Furuncle	13	..	..	13
Erysipelas	6	..	1	7
Parotitis	6	1	2	9
Adenitis	26	1	1	28
Adenitis Tbc.	4	2	1	7
Otitis media	6	3	1	10
Lupus	2	..	..	2
Actinomycosis	..	..	1	1
Tinia Barba	2	..	..	2
Epidermophytosis	18	1	1	20
Perionychium	2	..	..	2
Acne	72	..	..	72
Gas gangrene	4	..	..	4
Pruritis	3	..	..	3
Dermatitis Venenata	4	..	..	4
Acne Rosacea	4	..	..	4
Total cases	..	..	..	329

lief of symptoms as in the acute group may occur early in the course of treatment.

In the last group the course is more rapid. The treatment is usually given within two weeks and a favorable response is usually obtained within a week with complete disappearance of symptoms within from two to four weeks.

The course and results vary somewhat within the various groups as would be expected but time does not allow a detailed description of the course in each lesion. The essayists have treated 329 cases of infection and inflammation in the past two years with type and results given in Chart 4. A detailed report by the essayists on the roentgen therapy of cellulitis may also be found in the ILLINOIS MEDICAL JOURNAL, November, 1936.

In conclusion the essayists wish to urge you to try roentgen rays in those lesions that are not responding rapidly to the usual type of therapy.

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THE CONTROL OF RABIES

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The destruction of human life by rabies, motor vehicles, or the criminal's pistol, are all evidences of the uncontrolled advances of various phases of our complex civilization. We perfect the pistol but fail to prevent its being owned by the hold-up man; we perfect the motor vehicle and place a mental, moral or physical weakling on the driver's seat, turning him loose on roads which engineers know are unsafe. We pride ourselves on our ability to build vast cities, the physical evidence of the combined knowledge of every profession and trade; we assemble many persons in these cities and let potentially mad dogs roam among them.

Both ownership of the pistol and sale of ammunition can easily be controlled at the source. A medical examination and licensure of drivers will reduce the road hazard resulting from petit mal, night or color blindness, alcoholic susceptibility and other physical defects. If given the opportunity, engineers will build safe roads and physicians will put safe drivers at the wheel.

Intelligent and forceful medical leadership will eradicate rabies. The stray dog has no place in a civilized community and the physician need only make his voice heard to eliminate potential danger. Most of us are either soft voiced or inarticulate.

There were 18,466 reported dog bites in the State of Illinois, during 1936. This should be impressive enough to force us from our lethargy. Fig. 1 shows the distribution of these injuries by counties. It seems reasonable to suppose that many more occur, in view of the large discrepancy in numbers between those reported in the various counties. Such figures offer a direct challenge to the medical profession and all public health agencies.

Fig. 2 shows the geographic distribution of 263 dog heads examined during 1936 by the Department of Health for the State of Illinois and found positive for negri bodies. The number of animals bitten by these dogs or the financial loss from their destruction is not known. Neither do we have the figures on the number of persons bitten by these 263 dogs. The potential danger from these widely disseminated foci of infection needs no comment here; it speaks for itself.

At a cost of many thousands of dollars, a large number of the 18,466 persons bitten by dogs were treated with antirabic vaccine. This is a needless waste of taxpayer's money and patient's time. Fourteen to twenty-one injections are unpleasant, time consuming and costly. Ten individuals bitten by rabid dogs in the State of Illinois in 1936 were unsuccessfully treated and died. One need but see such a death once to feel that prophylactic treatment is indicated in every potential rabies. Every dog bite is a potential rabies when the disease exists epidemically in one's vicinity. Slides 4, 5, and 6 poorly depict the suffering of the afflicted child. The look of horror during the convulsive seizure, the scream accompanying the pharyngeal spasm, the wide palpebral orifice and the bloody salivation are characteristic of the disease.

The prevention of rabies may be accomplished in the following way:

A. Control of Dogs

1. Working dogs only may be free without muzzle or leash.

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2. Dogs kept as pets will be muzzled or on a leash when not on the owner's premises. Immunization affords still further protection.
3. All stray dogs will be empounded or destroyed.

B. Care of Bitten Persons

1. Local treatment.
   a. Whenever the skin is broken by an animal bite, it should be surgically cleansed and immediately cauterized with fuming nitric acid, using a glass rod or capillary pipette. It should be carefully used so that all of the injured tissue is fulgurated. Where bone or cartilage is injured, 95% phenol is preferable to nitric acid.
2. Anti-rabic vaccine should be administered.
   a. To anyone bitten or contaminated by a rabid animal.
   b. To any person bitten by an unknown, uncaptured dog.
   c. To anyone bitten about the head and neck.
   d. To anyone bitten by a sick animal or one which becomes sick while held for observation.

The principles of treatment as outlined are based on a report of 69,541 cases by McKendric, from the Pasteur institute. With this treatment, 0.23%, or 162 persons died. Cauterization was not done or was done too late in many of the fatal cases. Vaccine treatment was begun late in many of the others. The disease is a preventable one, but when it once occurs death results. No individual has ever been known to recover.

185 N. Wabash Avenue.

Fig. 1

Fig. 2

DISCUSSION

Dr. Maurice Schneider, Chicago: The diagnosis of rabies in a patient is extremely important from a public health standpoint. Other dogs and other persons may have been infected by the same animal. An immediate search of a neighborhood may prevent further fatalities, and by the elimination of stray dogs, may localize what might otherwise become a general epidemic. The diagnosis is dependent upon the history of a bite or intimate contact with a dog or other animal, ill or dead from rabies. In the presence of the disease in epidemic or endemic form, every animal ill or dying with paralysis, or with a violent change in disposition, should be looked upon with suspicion and the brains of all such animals should be examined for Negri bodies.

In a series studied at the Cook County Hospital, early symptoms, when taken in conjunction with a history of a dog bite, were sufficient for diagnosis. The earliest symptoms were those of a change in disposition, varying in length from one to seven days. It was unusual to have patients admitted to the hospital at such an early stage.

On entrance to the hospital patients not in a terminal stage were mentally clear, soon became talkative, very agitated and physically hyperactive. Accom-

panying these periods of agitation there was frothing at the mouth, inability to swallow, and vomiting—in most instances of a bloody fluid. The periods of agitation alternated with phases in which the patient appeared calm and exhausted. Convulsive seizures could be brought about by slight mental or physical irritation.

Pharyngeal spasms occurred during which the patients screamed with pain and often violently grasped their throats. Convulsive seizures were very violent, the children being tossed about without control. Temperatures were usually high, varying from 103 to 108 degrees F. The pulse was exceedingly rapid, being

Fig. 3

out of proportion to the fever and rising with each convulsion. Blood counts showed a leukocytosis varying from 15,000 to 20,000, of which 80 to 90% were polymorphonuclear leukocytes. The urine showed albumin in most instances, and in two cases sugar was present.

Spinal fluid examination was negative in all but one case studied. In a woman who had been ill for one week, who was undiagnosed until Negri bodies were found at autopsy, the spinal fluid showed a positive test for globulin and 125 lymphocytes. Spinal sugar and chlorides were normal. The laboratory findings were those of an acute infectious disease with cerebral trauma.

All cases died, and all showed Negri bodies at autopsy.

ACUTE INFECTIONS OF THE JAWS

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Acute infections arising in and about the oral cavity are of common occurrence, and because of the unfortunate terminations frequently seen, they become important as surgical conditions

The teeth themselves are unique anatomical structures, rather innocent in appearance, and yet they provide one common spot upon which dentist, physician and surgeon meet and often quarrel.

The dentist uses them to demonstrate his ability in restorative work, the physicians as a happy hunting ground for foci of infection, and the surgeon is called in to treat the infections which frequently occur when the teeth become diseased.

The jaws are normally resistant to infections, but in the event of insult added to infection they become peculiarly susceptible and osteomyelitis results, preponderantly in the mandible.

The soft tissues about teeth and jaws are susceptible to cellulitis, varying from a simple infection to a rapidly developing, overwhelming affair from which the patient may die in a few days.

While it is true that acute infections do arise from salivary duct obstruction or cyst infection, acute infections about the jaws usually trace their origin to the tissues in and about the teeth, either the peridental membranes or the pulp, as a result of some inflammatory process. Almost always the severe cases are complicated by trauma.

There are three common sources of infections of this type:

1. Death of the dental pulp as a result of decay or trauma, paving the way for the development of alveolar abscess.

2. Lesions of the peridental membrane, with the development of suppurating pockets along the root of a tooth. These pockets may close over and initiate the lateral tooth abscess.

3. Infections occurring as a result of persistent gum flaps over partially erupted teeth, occurring usually in the wisdom tooth region, particularly in the lower jaw.

The second and third of these sources of infection usually present no serious difficulty. The second condition responds to prompt incision and drainage, and the third condition is amenable to

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the localizing influence of heat and irrigations, resulting in serious complication only when extraction is attempted before the infection is controlled.

These infections originating around partially erupted wisdom teeth, covered by a more or less loose gum flap may be quite serious. I believe such an area may be the nidus of infection responsible for the recurrent attacks of trench mouth or acute ulcerous gingivitis, as the infection was named by Thomas L. Gilmer, who published an excellent description before the organisms responsible were discovered by Vincent and Plaut.

Extraction of these teeth during a period of local inflammation may result in a severe infection.

For the purposes of this paper we are particularly concerned with infections originating from the first of these three sources, viz., those which occur as a result of infections of the dental pulp.

It seems to be true that jaw infections may occur as extensions from the nasal or antral mucosa, as blood-borne infections or as extensions of skin infections such as the furuncle.

We believe, however, that infections about the teeth are responsible for the great majority of jaw involvements.

In clean, edentulous jaws these infections are never seen except as a result of injury, such as fracture.

Acute true alveolar abscess may occur as a result of death of the dental pulp with infection spreading through the apical foramen of the tooth, or may occur as a flare-up of a chronic alveolar infection of long standing, and from the same source.

In both cases cellulitis of some degree occurs as an extension through the periosteum into the surrounding soft tissues.

In infections following soon after the death of the pulp, ill-timed extraction of the offending tooth is likely to result in the extremely dangerous spreading infection, whilst that occurring after the bone has already been invaded by the chronic infection is more likely to lead to osteomyelitis.

Acute alveolar abscess exhibits all the signs and symptoms of an acute inflammatory process. The gum is tender, swollen, red and the tooth is elongated and tender to percussion. There is intense pain and elevation of temperature.

As pus forms and perforates the bone, swelling will increase and symptoms of cellulitis appear according to the location of the abscess, in the upper or lower jaw. Trismus will appear as the muscles of the lower jaw become involved in the inflammatory mass.

Infrequently, the extension of the infection is to the tissues forming the floor of the mouth, with added discomfort in swallowing. If the infection spreads with great rapidity and fails to localize, binding all the soft structures into a boardlike mass, we have the condition known as Ludwig's angina.

Dental infection is the most common cause of this condition, in which there is a high mortality rate.

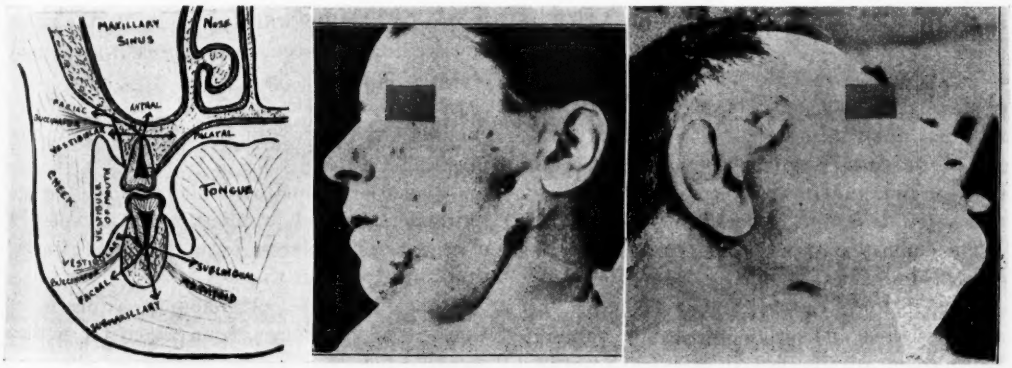

Fig. 1. (Left) Diagram illustrating variations in course taken by dentoalveolar abscesses in upper and lower jaw. Fig. 2. (Middle) It is desirable to avoid such incisions as this above the lower border of the mandible which leaves disfiguring scars and may injure important structures, such as facial nerve fibres and parotid duct. Fig. 3. (Right) Incisions for through and through drainage of ascending suppuration over ramus of mandible. One opening below the border of the mandible and one above the zygoma. Injury to the important structures is avoided, and scarring is negligible.

Because of the extremely hard and unyielding swelling, the greatest difficulty is experienced in swallowing and respiration. Sepsis develops and pneumonia or edema of the glottis may supervene.

The diagnosis of acute alveolar abscess is usually a simple matter. Submaxillary swelling from this source is a cellulitis and not a lymphadenitis as pointed out by Sébilean,[1] and the presence of trismus is an important point to be observed.

Swellings resulting from ranula, cyst infection, or salivary gland obstruction are differentiated on the basis of history and examination.

The treatment of acute alveolar abscess is drainage. The picture of a person with neckerchief swathed, swollen face, is an ancient one, typical of acute alveolar abscess.

The treatment accepted then, and by many today, is immediate extraction of the offending tooth.

It is true that in a large number of cases this treatment is adequate. However, it is also too true that this treatment given in too many cases results in disaster, extreme embarrassment for the operator and grave illness for the patient, with often deformity or death.

The claim that immediate extraction provides prompt drainage is not well founded.

Even in the presence of pus, drainage is not always secured, and such a procedure merely adds the burden of trauma to already overtaxed tissues.

A better plan is to aid localization by means of heat, make early incision within the mouth through the periosteum over the suspected area and defer the extraction of the offending tooth until the acute symptoms have subsided.

In the upper jaw almost invariably drainage may be obtained through intraoral incisions.

In the lower jaw it is more often necessary to drain extaorally.

Skin incisions should be made beneath the lower border of the mandible and stop at the superficial fascia; exploration for pus should be done by blunt dissection.

It should be remembered that the facial artery and accompanying inframandibular branch of the facial nerve cross the mandibular border.

In the event that suppuration extends upward along the ramus, it may be necessary to make an incision along the lower border of the zygoma. These incisions may be connected and a tube inserted to obtain through and through drainage.

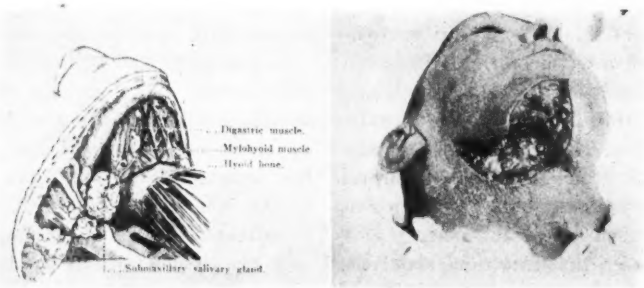

Fig. 4. (Left) Location of the submental and submaxillary lymph nodes. Lines of incisions for dividing the digastric and mylohyoid muscles in an indurating cellulitis of the floor of the mouth. Fig. 5. (Right) Showing how the tissues open up after making the incision described for Ludwig's angina.

In all cases of acute alveolar abscess varying degrees of cellulitis will be present. In the upper jaw swelling may occur in the cheek; the eye may be closed.

In the lower jaw there will be submaxillary swelling and the floor of the mouth may become involved.

Unless complicated by dental trauma, the cellulitis is controlled by moist heat and subsides or progresses to abscess formation, necessitating drainage of the soft tissues.

The rapidly developing and spreading infection in the soft tissues, from which the patient dies in a few days, usually follows dental trauma inflicted during the early stages of an acute alveolar infection.

The septic indurations of the floor of the mouth, of which Ludwig's angina is the most

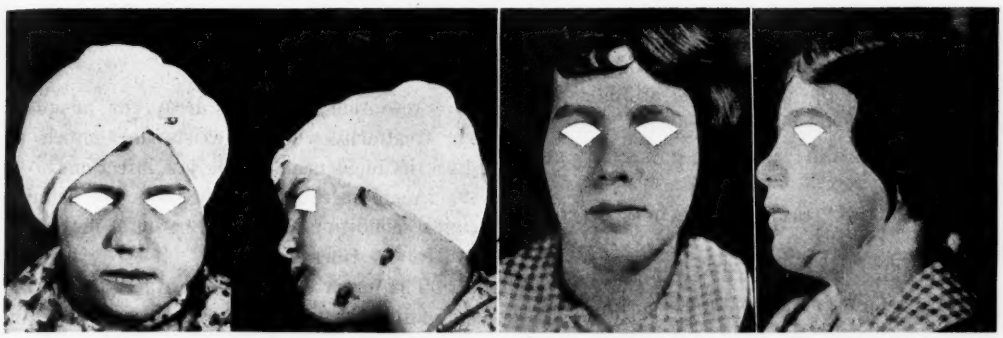

Fig. 6. (Left) Dorothy L. A. Showing jaw involvement on presentation. B. Incisions made for drainage. Fig. 7. (Right) Condition, November 21, 1930.

serious, are to be treated by early incision. This procedure provides for drainage and freedom from the upward pressure which causes dysphagia and respiratory embarrassment. Done under local anesthesia, these incisions should extend in the midline from the symphysis of the mandible to, or beyond, the hyoid bone and laterally on either or both sides from hyoid to the angles of the jaw, extending through the deep fascia. Figs. 115-116 (Blair and Ivy).

Search is made for pus and the wounds packed with gauze. If respiratory embarrassment persists and pneumonia is ruled out, tracheotomy is to be considered.

The bones of the jaws become involved in acute inflammatory processes, either as a periostitis or as an osteomyelitis, or both together.

The pus of an alveolar abscess may immediately find a way through the bone and spread beneath the periosteum, endangering the bone in this area, or it may progress through the central cancellous bone.

These are the common sources of osteomyelitis or necrosis of jaw bones, although such conditions infrequently occur as a result of septicemia, specific infections, eruptive fevers and metallic poisons.

So vast an amount of work has been done on these acute infections of the jaws during the last forty years by G. V. Black, Blair and his associates, Wilensky and many others that they cannot be denied definite surgical importance.

The whole subject has been epitomized by Blair in a rather classic monograph entitled "The Ulcerated Tooth."[2]

Blair and Brown, reporting on osteomyelitis of the jaws, give a tabulation of 40 cases, 33 of which were apparently associated with tooth infections.[3]

In this series the lower jaw was affected over four times more frequently than the upper.

They also mention the fact that Heister in 1710 warned against extractions in inflammatory infections of the jaws.

In a report of another series of cases, Brown and Tung[4] find that the ratio of lower to upper jaw infections remains about the same, i.e., 4 to 1.

The greatest number of infections occurred between the ages of 11 and 50. The greatest incidence being in the third decade.

In 234 cases tabulated, 197 were directly associated with the teeth as follows:

1. Spontaneous occurrence following dental caries, 70.
2. Associated with fractures, 17.
3. Extraction during acute stage of infection, 105.
4. Associated with root canal treatment, 5.

The remaining 37 cases combined all other sources.

In acute bone infections the fulminating stage is followed by the chronic stage in which the infected bone is absorbed, or in which sequestra form, depending upon the virulence of the infection.

The early symptoms of acute alveolar abscess and osteomyelitis are essentially the same, and bone involvement may be suspected if recovery does not follow adequate treatment of the acute abscess.

The fever and prostration will be greater and the teeth will become loosened, whilst pus will be detected emerging from around them or through sinuses in the soft tissue; probing may demonstrate denuded bone. Until such time as the

bone becomes decalcified, x-ray examination reveals little evidence.

In the treatment of osteomyelitis of the jaws we have adopted the wise counsel of Blair, who used as his text the Italian proverb, "He who goes slowly goes safely; he who goes safely goes surely."[5]

There are three cardinal principles of treatment:

1. Establish drainage with least trauma.

2. Wait for virulence of infection to subside, during which time the dead bone has a chance to separate and new bone to form. If this principle is observed, the continuity of the jaw will be preserved. It is during this period that the patient's morale and resistance will be tested; everything should be done to bolster and improve both. Free drainage must be maintained throughout this time.

3. Removal of sequestra, without disturbing the surrounding bed of granulation, if possible.

Teeth (or tooth buds in young mouths) are best left alone. These tissues show remarkable recuperative powers and are unquestionably valuable, in the event that pathological fractures occur, for wiring the jaws.

In young mouths the erupting teeth play an important role in the development of the jaws, and preservation of the tooth buds averts the tragedy of gross deformity.

This conservative plan of treatment is approved by most surgeons, although early and radical bone surgery is practiced by a few. It would appear that a plan which rarely if ever results in failure is to be preferred to one in which too energetic interference may imperil the regenerative powers of the bone and at best may necessitate bone grafts or transplants to bring about a satisfactory result.

Summary.

1. Prevention of tooth decay, or adequate early treatment when it exists does much to reduce the incidence of acute jaw infections.

2. Acute infections of the jaws are definite surgical conditions requiring prompt but conservative treatment.

3. The importance of physical and laboratory examinations cannot be overemphasized.

4. Nursing care should be of the best. Because of the dysphagia often present these patients are dehydrated and lack nourishment.

Intake of fluids and nourishment must be provided as indicated.

122 South Michigan Ave., Chicago, Ill.

Case 1. Mr. X., was brought to our clinic with the idea of determining whether or not his total blindness might have resulted from the extraction of an infected lower molar.

His story was that next day following the extraction he had a severe secondary hemorrhage. This was controlled and four days later, during which time great pain had been suffered, marked swelling of the face occurred.

He was taken to a local hospital and massive foments were applied. The swelling extended over the jaws and face, the eyelids being involved so that the patient was unable to see.

Incision and drainage reduced the swelling after several days but the vision in both eyes was gone.

Examination revealed the fact that the right globe was completely atrophied, and whilst the left was normal in appearance vision was totally lacking.

These are the uncorroborated facts of the case, and the mechanism of the infection must therefore become a matter of speculation.

It is known that there is direct venous drainage from the lower jaw through the inferior ophthalmic vein,

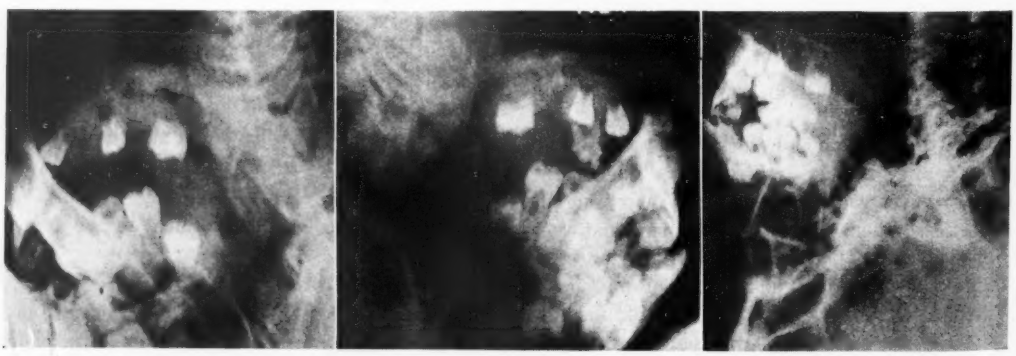

Fig. 8. (Left) Radiogram, September 20, 1928. Fig. 9. (Middle) Showing unerupted permanent teeth surrounded by an area of infection, October 22, 1928. Fig. 10. (Right) Radiogram, April 3, 1929.

and also the cavernous sinus, also metastatic infections from tooth infections have been known to reach the choroid.

That a pan—ophthalmia or even a sympathetic ophthalmia might eventuate, is conceivable.

Case 2. Mrs. A. U., aged 46 years, entered the hospital on June 11, 1930, complaining of a lower jaw swelling of one week's duration, following the root canal treatment of a lower bicuspid tooth, entailing the removal of a dead pulp, five weeks previously.

On admission the temperature was 103.2. There was a marked swelling involving the floor of the mouth and the anterior triangles of the neck.

The skin over the swelling was tense and red and very tender.

Admission Diagnosis: Osteomyelitis of lower jaw with acute cellulitis. One day later patient was given ether and an incision made beneath jaw for drainage.

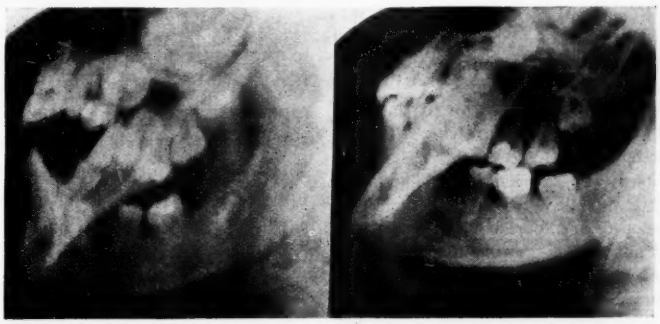

Fig. 11. (Left) Radiogram, November 21, 1930. Fig. 12. (Right) Radiogram, October 1. 1935.

At first there was only slight drainage, but the temperature began to drop, and in three days the discharge of thick greenish pus became profuse.

Culture report of material from incision: Medium heavy growth of Staphylococcus aureus, hemolytic strains. Medium heavy growth of Streptococcus, viridans.

June 28, '30. Jaw x-rayed and a good deal of rarefaction was noted.

June 30, '30. It was noted that the teeth in lower jaw were becoming loosened.

July 9, '30. First of loosened teeth picked out without anesthesia. General treatment by drainage and irrigations continued. The patient's general condition improved. Her temperature fluctuated between 99° and 101°.

July 18, '30. First sequestra began to protrude through soft tissue. Several more teeth were extracted.

July 28, '30. Large sequestrum removed from lower bicuspid region. 5x3x2 c.m. Particles of bone were removed from time to time until patient left hospital August 6, 1930, and was to report for further treatment at office.

Sept. 11, '30. Three large sequestra removed.

Sept. 23, '30. Three sequestra removed.

Oct. 7, '30. One large sequestrum removed.

Oct. 15, '30. Three sequestra removed.

Dec. 4, '30. Large sequestra removed, drainage practically at end.

Dec. 23, '30. No drainage except from one sinus.

Jan. 16, '31. Progress satisfactory, still one sinus.

Feb. 19, '31. Very slight drainage.

March 19, '31. Two small sequestra removed.

April 2, '31. Apparently well.

May 4, '31. Progress satisfactory.

June 4, '31. Entirely well. Regeneration of practically all body of mandible.

Treatment 12 months.

Case 3. Mr. H. F., aged 29. Patient entered hospital complaining of a painful swollen left jaw.

He had had pain in the first lower left molar for about 2 months.

A dentist attempted to extract the tooth but without success.

The pain continued, and four days later the extraction was completed under nitrous oxide anesthesia. The pain grew worse and swelling began to appear.

The temperature began to rise, and in two days was elevated to 103.3.

There was very little salivation. The gums in the region of the first molar were deeply infected and swollen, with several white ulcerated areas on the outer gum and inner cheek. The teeth on either side of space were not painful.

Externally, there was slight swelling below and behind the angle of the jaw, with a few deep cervical glands palpable.

Tenderness extended from below the jaw margin up to the ear and on to the supra-zygomatic region. Movement of the ear elicited pain in the ear.

Under the influence of sedatives—hot applications and hot mouth washes, the condition of the patient improved, although slowly, and with quite wide daily variations in temperature.

Five days after admission localization appeared to be accomplished, and incision externally released a lot of foul smelling pus. Denuded bone was felt through the incision. Moist dressings were continued and eight days after admission temperature was normal.

Patient was discharged 14 days after admission. Smear and cultures in this case showed many fusiform

bacilli, with cultures of mixed staphylococcus and a gram positive bacillus. Wasserman negative.

X-ray examination showed an irregular area of rarefaction of the jaw bone underneath site of second molar extraction.

Case 4. Mr. J. S. G., aged 35, entered the hospital on January 16, 1937. On admission he complained of pain, tenderness, swelling and redness of the left jaw, left cheek and left side of neck. Temperature was 103 degrees F.

Examination confirmed the complaint. The urine showed plus albumin but otherwise normal. The white blood count was 7,700.

Heat was applied, fluids given. Pain was controlled with salicylates and on January 18 the left molar region was incised through the buccal tissue.

A quantity of pus was evacuated. The temperature fell to normal, and the patient's complaints began to disappear.

The patient was discharged, on January 26, with the diagnosis of:

Acute periostitis and alveolar abscess originating from a long-standing peri-apical infection.

Case 5. Dorothy L., aged 7 years. This patient presented, complaining of a swelling involving the left lower jaw and extending into the neck.

Six months previously she had had an aching lower left 1st molar filled. A week or so later an acute alveolar abscess developed and during this period the tooth was extracted under local anesthesia. Hot applications were advised and 24 hours later swelling increased and spontaneous discharge of pus occurred in the cuspid region. Five weeks later an abscess pointed beneath the mandible. This was treated by incision and drainage, and the patient then referred to our clinic.

The general condition of patient was good, and there was no particular pain or discomfort except a generalized tenderness over the left side of face which was badly swollen. Temperature was 100.2°.

Mouth examination revealed a hard subperiosteal swelling extending from the angle of the left side of the jaw forward to the symphysis. Extension had occurred into the neck, the swelling being hard and diffuse. A yellowish purulent exudate drained from an incision beneath the chin.

The mouth was unclean and the teeth were badly decayed.

This patient was treated conservatively, adequate drainage maintained at all times and sequestrae removed as indicated.

The unerupted permanent teeth were preserved and the patient recovered completely without deformity.

She was discharged and referred to an orthodontist in March, 1930, eighteen months after the onset of the acute infection.

The x-ray illustrations will show the progress of this case.

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Note: Figures 1 to 5 from Essentials of Oral Surgery, Blair and Ivy, 1936. Courtesy of C. V. Mosby Company, St. Louis, Mo.

A REPORT ON TWO HUNDRED CATARACT OPERATIONS

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This is a report of two hundred cataract extractions selected alphabetically from the records of a private practice in what might be termed a rural community. They are not selected cases but are mine run. Of this number, 115 were extracapsular extractions, 8 were delivered by the erisophake after the method of Barraquer, and in 5 cases it was found necessary to resort to the vectis to complete a successful operation. Intracapsular extraction with the Kalt Elsch nig or Arruga forceps was attempted in 90 instances, 72 of which were successful, and in 18 of this number the capsule ruptured making it necessary to complete the operation by the extracapsular method. In 5 of the 18 cases in which the capsule was torn it was possible to extract the capsule after the lens had been delivered, so we might be permitted the statement that 77 of the 90 cases to extract the lens in toto were successful.

Our final visual results are shown on the following chart:

No. Cases	*Visual Results*
3	20/15
110	20/20
13	20/25
32	20/30
17	20/40
7	20/50
3	20/80
1	20/100
6	20/200
4	15/200
2	5/200
2	Complete Failure

Another way of expressing the results in this series of cases is to say that 182 were in a practical way successful as the patient was, after the operation, able to read and perform near work. Thirteen found it possible to make their way about without aid but could not do near work with any degree of satisfaction and five might be called complete failures.

A complete iridectomy was performed in 63 cases and iridotomy in 137 instances. One eye

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was lost by expulsive hemorrhage and was eviscerated and in two other cases, the final result was an atrophic bulb.

The age incidence ranged as follows:

Percentage of Cases	Age Range
1%	Over 90
4%	Between 80 & 90
30.5%	Between 70 & 80
35%	Between 60 & 70
20%	Between 50 & 60
7%	Between 40 & 50
2.5%	Between 30 & 40

The average number of sutures employed was three with a minimum of one and a maximum of eight.

As to the occurrence of astigmatism:

No cases.	Astigmatism in Diopters
54	None
71	Under 2
40	Between 2 & 3
17	Between 3 & 4
12	Between 4 & 5
5	Between 5 & 6
1	7

Seventeen needlings on 13 cases were performed in the total of 115 extracapsular extractions. These figures are surprisingly low and I believe this may be attributed to the use of irrigation following extraction.

The following chart summarizes the types of cataract:

No. Cases.	Type.
18	Diabetic—4 of which showed hyphemia at first dressing and in one instance there was loss of vitreous.
5	Secondary to iritis.
1	*Secondary to glaucoma.*
3	Morgagnian.
3	Hypermature.
2	Complicated.
1	Complicated by Central Leucoma.
163	Senile.

Complications during operation are revealed on the following chart:

No. Cases.	Complications.
2	*Lens dislocated during incision.*
3	Very rigid iris.
2	Lens dislocated in attempting delivery.
3	Incision too small.
1	Unintentional corneal incision.
2	Cocain poisoning.
1	Fish-mouth wound.
13	*Vitreous presented.*

In the 13 cases where the vitreous presented, the following visual results were obtained:

No. Cases.	Visual Results
5	20/20
1	20/25
3	20/30
2	20/40
1	20/80
1	Nil

High myopia was present in 4 cases and extremely high blood pressure in one case. It was necessary to perform a canthotomy in one case and in two, preoperative blood-letting was neccessary.

Post-operative complications were as follows:

No. Cases.	Post-Operative Complications.
1	Expulsive hemorrhage.
6	Iris prolapse.
13	Hemorrhage in interior chamber. (Poor vision resulted in only one of these cases).
3	Hemorrhage in vitreous.
3	Iritis.
5	Macular degeneration.
1	Low grade uveitis.
1	Vomiting.
1	Iridocyclitis.
1	Deep permanent keratitis.
6	Flat anterior chamber.
1	Bilateral glaucoma.

Types of extraction:

INTRACAPSULAR	EXTRACAPSULAR	
No. Cases.	Complications.	No. Cases.
4	Hemorrhage	9
1	Keratitis	0
4	Vitreous	9
1	Iritis	2
2	Prolapse	4
1	Uveitis	0
0	Expulsive Hemorrhage...	1

The advantage of the intrecapsular technic is the absence of reaction and uncomplicated healing.

Slow restoration of the anterior chamber was found in 6 cases and curiously enough they were all in diabetics. In one bilateral diabetic the anterior chamber was not re-established until the fourteenth day and in the opposite eye on the *tenth day. In neither eye did this complication* correct itself until the dressing had been discontinued.

Considerable care should be exercised in estimating the condition of nerve and retina before operation. Perception should be estimated at eighteen inches and at twenty feet fixing the *examined eye on one light with estimation of the* location of a second light. This test will often give valuable information. At least the surgeon will be in a position to make some approximate estimate of what final visual results might be expected.

The question which may arise is what amount of vision constitutes a successful case. In my *opinion, one is justified in considering 20/50* vision or better as being far from a failure as in practically all of my cases of 2/5 or 1/2 vision, I have found it possible by careful refraction to give the patient a reasonable degree of satisfaction both for far and near seeing.

A brief description of the technic which was employed is as follows:

The patient is admitted to the hospital the

night before operation. Diabetics are admitted several days prior to operation in order to get the blood sugar reduced to the proper point for surgery. Following admission a pad saturated with acridinium compound is kept on the eye to be operated on for twelve hours. No cultures are made.

One-half hour before operation one ampoule of sodium luminal is given hypodermically. Euphthalmine 2% is instilled four times during the hour prior to bringing the patient to the operating room. Eight or ten instillations of 4% cocain are made during the twenty minutes preceding the operation. Two drops of 1:1000 adrenalin chloride is used a few minutes before the section is made. Either O'Brien or VanLint akinesia was used and in several instances both were employed. A retrobulbar injection of one and one-half c.c. 4% novocain is made. Two or three drops of 1:1000 adrenalin chloride is injected sub-conjunctivally at 6:00. No irrigation of the conjunctival sac is employed. A Bridle suture in the superior rectus muscle is used.

Conjunctival fixation is employed. A broad section is made with a narrow conjunctival flap. In each instance an attempt is made to have a 2 m.m. flap throughout the extent of the incision with perhaps four or five m.m. at the apex.

Immediately following the section, two very fine Moria silk sutures are inserted—each about ten degrees on either side of the mid-line. These are looped and set ready to tie. The apex of the flap is lifted back and an iridotomy performed—care being taken to avoid buckling of the cornea. In case there is blood in the anterior chamber, irrigation is used at this point.

I find that the subconjunctival injection of adrenalin prevents the contraction of the iris sphincter which so frequently occurs after the section is completed.

The flap is then lifted and a Kalt, Elschnig or Arruga forceps is introduced and the capsule grasped as low down as possible. One should see clearly just how much bite is being taken. I must remark that recently I have had a definite leaning toward the Arruga forceps. Deliberate side to side movements are made and counter pressure is exerted with a heavy hook 3 m.m. below the limbus at six o'clock. If the zonule is resistant, side to side sweeping motions are made in the counter pressure. Violence has no place in ophthalmic surgery. Unwarranted manipulations should be avoided at all times.

The lens is tumbled in this fashion and as the lower pole ascends the counter pressure is continued and the lower border of the lens is followed by gentle pressure in an upward direction thus delivering the cataract by a combination of counter pressure and traction. The two loop sutures are now tied and additional sutures inserted to give a firm closure of the entire wound. In extracapsular extractions, irrigation is employed before the first two sutures are tied.

I am particularly anxious to get firm closure at both angles of the wound as I feel that a prolapse is more apt to occur at these points. It goes without saying that the iris is stroked into position before the auxiliary sutures are inserted.

Eserine ointment, 0.25% is instilled in cases having a round pupil and atropine ointment 2% in cases where complete iridectomy has been performed. Small dry cotton and gauze dressings are placed over both eyes and a Fox aluminum shield is sealed in position over the eye operated on.

The patient is lifted from the operating table to the cart on a Gwin Flex band stretcher and from the cart to the bed using the same apparatus. He is kept on his back for three hours after which time with assistance he is allowed to turn on the side not operated on. A back rest is used the next day. Dressings are made daily. The eye not operated on is uncovered at the first dressing. The patient is allowed to sit up on the third day and is permitted to go home on the ninth to twelfth day.

Some explanation should be given the cases where poor vision was obtained.

Case 135 was a female, aged 75 years, with a senile cataract. A simple extracapsular extraction was performed with no complications and four sutures were inserted. The dressings were applied and the patient was about to be wheeled from the operating room when she complained of severe pain in the eye operated on. The dressing was removed and found to be saturated with blood. All the stitches had torn loose and expulsive choroidal hemorrhage was in full swing. An evisceration was immediately performed. The blood pressure in this particular case was systolic 120, diastolic 70 and there were no physical signs of arteriosclerosis.

Case 99 was 50 years old with a mature cataract in the right eye. A combined extracapsular extraction was performed. On the fifth day an iridocyclitis of severe character developed, and finally resulted in an

atrophic bulb with vision nil. This patient had had the benefit of a thorough preliminary examination.

Case 11 had a combined extracapsular extraction with slight loss of vitreous. Four sutures were inserted and a shield applied over the dressing. She was a ward patient, quite unruly and difficult to handle, and when the dressing was made on the second day, a gaping wound was encountered which was immediately closed with some further loss of vitreous. Irodocyclitis followed with an atrophic bulb and vision nil.

Case 54 was a male 60 years of age with black cataract. In attempting to do a Kalt extraction, the capsule was ruptured and the lens sank out of sight. A vectis delivery was accomplished with very slight loss of vitreous. Hemorrhage in the anterior chamber occurred on the fifth day. This was readily absorbed and the best vision obtainable at refraction was 6/200. Macular degeneration was present.

Case 110 was a female, aged 70 years, in which an attempt was made to extract by the Kalt method but the capsule ruptured and extracapsular operation was performed. On the eighth day a large hemorrhage was noted in the vitreous body. The final visual result was 10/200.

Cases 92 and 40 with vision of 15/200, cases 25 and 130 with vision of 20/200, were all found to have macular degeneration. The low visual result in case 170 of 15/200 was the result of a large central dense leucoma which had existed prior to the operation.

Number 15 was a male aged 74 years. Following an intracapsular extraction a severe prolapse was found at the first dressing. The end result was a drawn up hammock-like pupil with vision of 20/200.

Number 24 was an intracapsular extraction with iridotomy in which there was extensive hyphemia on the sixth day. The best vision obtainable was 20/50.

Case 123 was 45 years of age with a severe iris prolapse at the nasal angle occurring on the second day. Five diopters of astigmatism was found at refraction and the final visual result was 20/40.

Case 124 was the opposite eye in the same patient in which an iris prolapse occurred on the second day. Seven diopters of astigmatism was found and the vision was 20/80. I regard myself open for criticism for not having performed a full iridectomy in the second eye.

Case 150 was a diabetic cataract aged 60 years. A combined extracapsular extraction was performed because of a very rigid iris. Hemorrhage in the anterior chamber occurred on the third day. The final visual result was 15/200 after one needling. Central choroiditis was present.

Case 194 was a male aged 52 years with a mature cataract and an uncomplicated intracapsular extraction. On the third day a rather dense keratitis was noted. I felt no apprehension as I expected this would clear within a few days or at most a few weeks. Instead of this, however, the cornea became more dense and in spite of numerous measures used over a period of eighteen months to clear the cornea, no improvement has occurred. The final visual result was counting fingers at five feet. Repeated physical examinations revealed nothing which could have in any way been responsible for this complication. At the present time the cataract on the opposite eye has reached that stage of maturity which almost demands that some operative procedure be resorted to and the question is, what type of operation should be employed. Probably an intracapsular extraction using a broad conjunctival bridge would be the best procedure.

Case 79 was senile cataract in a male aged 70 years. While the section was being made, for some unknown reason, the patient jerked his head and a corneal incision was the result. Iridectomy and intracapsular extraction followed. Central choroiditis was found. Vision of 20/80 was obtained.

Case 103 was interesting because of having had a trephine for glaucoma five years before she came to operation for cataract. There was an iris Bombe with complete posterior synechiae. There was a good trephine bleb and the tension was 20 Schiotz. An iridectomy was completed along with the incision concluding both operations with one sweep of the scalpel. The iris was separated from the lens with a thin spatula and extraction was performed with the capsule forceps. There were no complications other than a slight loss of vitreous. The visual result was 20/20.

Cases 139 and 140 were bilateral extractions in a high myope. Both cataracts were mature and in both eyes the lens was dislocated during the incision, each instance requiring a vectis delivery.

The causes of complete failure were as follows:

No. Cases.	Complications.
3	Irodocyclitis.
1	Retrobulbar hemorrhage.
1	Deep persistent keratitis.

Causes for vision of 20/50 or less as follows:

No. Cases.	Complications.
6	Macular degeneration.
1	Choroiditis.
1	Hemorrhage in vitreous.
1	Extreme hemorrhage anterior chamber.
1	Secondary iritis.
1	Central leucoma of cornea.
1	Deep keratitis.

Prolapse cases were treated with trichloracetic acid. Excision of the prolapse was made in only one instance. There were four cases with poor visual results from prolapse of the iris out of a total number of six.

A cataract operation is now a relatively safe procedure on all types of patients. Unruly patients are few and far between. The recent percentage of good visual results are in my opinion a direct result of the employment of akinesia, retrobulbar injection, the bridle suture of the superior rectus, preliminary sedative, conjunctival or corneoscleral sutures, canthotomy in instances and last but not least rubber gloves and the face mask. It would be difficult to give this list in order of importance.

In conclusion, I would like to say that all

surgeons should analyze at least a reasonable number of their cases regardless of whether or not they are ever reported. It may give you hope or inspire you to greater efforts.

DISCUSSION

Dr. O. B. Nugent, Chicago: I know we have all enjoyed Dr. Gailey's pictures and also his presentation. I know something about the difficulties of making these pictures, and I can appreciate it more than anyone who has not had the experience. It was delightful to sit and watch him perform that operation on the screen. I was very much impressed with his statistics. They are, I think, about the average. They are very good, and if not average, better than average I should say. However, I do not like visual results reported as a criterion as to the operation you are using, whether good, bad or indifferent. Often we see eyes that are blind after operation, and yet from all appearances a perfect operation was performed. That gives that operation a black eye, so to speak. The operator may have performed the operation skilfully, may have been a master at it, but got a poor result. However, the result would probably correspond to that obtained by any other type of operation, as long as the man was a master at the work.

I have been especially interested in the intraocular tension, which I consider with a great deal of respect. If a patient has a high intraocular tension he is a potential trouble-maker. I mean the amount of complication we may have during operation is very high in that type of patient. I respect intraocular tension more than increased blood pressure. I see very few bad results that I believe have come directly from high blood pressure, but I see a high percentage of complications in patients who have a high intraocular tension, or increased intraocular tension. Now, the question is how can we reduce the tension so that the patient is safe to operate on? That is a condition that we must meet as it exists. Once a patient has an established glaucoma, regardless of whether or not the tension is down at the time of operation, he is still a potential complication. We must take into consideration that a certain percentage of glaucoma exists in patients who do not have cataract. That same percentage probably carries through in those cases operated on for cataract. Knowing so little about glaucoma as we apparently do, judging by the different theories about its cause, it is reasonable to believe that a certain percentage of these cases following operation would naturally have glaucoma, because of the percentage of senile cataract in patients who would have had glaucoma later. So we can excuse a certain percentage of these cases as being just a natural senile complication. Diabetics are always bad risks, whether you reduce the sugar in the blood and keep it down or not, they are potentially complicated cases.

Putting a suture in the superior rectus muscle is not an easy process, although it seems simple. I notice very often that many operators are not putting a suture under the superior rectus muscle but in the conjunctiva above the muscle. This is important, because when you want to use the suture in a complicated case, you pull the conjunctiva down in attempting to control the eye and your bridle suture is of no value because it is not in the superior rectus muscle.

He mentioned examination on the second day after operation. I was taught not to look at the eye operated on for five days after operation, not even open it. That was our custom in India. I think this is not necessary when we employ sutures to close the yound. There is no danger in looking at the eye within twenty-four hours, and I find oftentimes that the patients are in need of an instillation of atropine. The pupil may be small, or there may be blood in the anterior chamber or an unusual amount of irritation, so often I feel that atropine should be used within twenty-four hours after operation, although not as a routine. And you cannot use it unless you look into the eye or open the lids. So I feel that examining the eye twenty-four hours after operation is a proper procedure. A shallow anterior chamber following operation is not frequent.

I wish to thank Dr. Gailey again for his very comprehensive presentation.

Dr. Samuel J. Meyer, Chicago: The author is to be congratulated upon the presentation of such a well organized report and the high type of surgery maintained therein. Seventy-two successful intracapsular extractions in ninety attempted cases is an excellent percentage and about equals the reports of some European masters working with much more material. The final visual results are excellent, one half being 20/20 or better. The number of needlings performed is very low and probably helps to account for the excellent final visual result, as needlings, per se, are not without their dangers. Vitreous loss is about 6.5%, which is an excellent average.

The pre-operative and operative technic is good, but I prefer to use a retrobulbar injection of 1 c. c. novocain, 2% solution with m iij of adrenalin 1/1000 solution, rather than injecting the adrenalin subconjunctivally. This results in a lowering of the intraocular tension and makes the eyeball safer to operate upon. I believe that those of us who do any considerable number of cataract operations would benefit materially if we kept careful records of all the necessary details involved, including our operative complications, especially vitreous prolapse, the number of completed positive intracapsular extractions, etc., and a complete list of our post-operative complications and the final visual results. Only by such means can we compare our final results and surgical ability with the older European masters with their series of thousands of cases.

After viewing the excellent moving picture of the operation I want to make a few comments. I notice that Dr. Gailey does more pulling of the lens than he does pushing. I have always been taught to do a combination of both. I think it is safer to divide the trauma between push and pull. It does not make much difference what technic you use. Dr. Gailey sits behind the patient; we sit in front. One should be comfortable when operating. I think his method of sit-

ting before a low table with his hands on his knees will help to minimize tremor. I note he does a lot of irrigating. Personally, I try not to do much if I can see where I place the forceps. One should not attempt to grasp a lens when the anterior chamber is full of blood, because you are apt to push the lens down.

With reference to post-operative glaucoma I think it brings up the old Heine operation, cyclodialysis, which is of value. I think it should be the first consideration when post-operative glaucoma occurs. I think we will find if we follow up these patients we will see more of them; if we do not see them for six months it is too late to do anything. If you could follow your patient for six or more months you might obviate a complete loss of vision, or almost complete loss of vision. We are using at present a cellulose tape instead of adhesive, and we find it much more satisfactory except in hot weather. It pulls off the skin very easily and holds well enough so that the dressing does not fall off. We dress all cases every day following operation so we do not need anything that will hold four or five days. I think you will find it a little safer to use than ordinary adhesive, because some patients will squeeze the eyelids when you pull the tape off.

In operating with a round pupil there is some controversy as to whether one should use atropine or eserine following operation. I think eserine should be used to try and prevent prolapse. I think that on the second or third day one should change to either homatropine or atropine to avoid any adhesions, because in practically all operations you will find there is a tendency to prolapse of vitreous through the pupillary aperture. It may lead to some postoperative inflammation, and if we do not look at it we are sometimes puzzled about a red eye. Another thing is a pulling up of the iris at 90 degrees for some reason that has not been satisfactorily explained. Of course this does not interfere with the final result.

I think Dr. Gailey has done a wonderful piece of work.

Dr. A. B. Middleton, Pontiac: This being a report of private cases is of much more benefit in the way of follow-up than clinical cases. It might be well for younger oculists not to become alarmed and think that elaborate technic is necessary in all cataract cases. The older men know we are passing through the stage in life where we are doing many things with a hope that they will prove to be better than the old methods. Every time anything goes into an eye, whether it be a needle, spatula or anything else, we are taking an additional chance of infection. The simple cataract extraction is fast coming back into routine use. In Dr. Gailey's hands this method is very nice and beautifully done. Be that as it may, the main thing is to obtain good vision in the eye. If his technic gives him the best results, that is the operation for him to use, but if others get good results with their technic, that, of course, is the operation for them to follow.

Dr. Thomas D. Allen, Chicago: Dr. Gailey, we all have cases of postoperative vomiting. I think that has worried me more in the last few months than anything else Would you be willing to tell us how to control that? We thought it might be due to barbiturates, but we still have the postoperative vomiting. We thought it might be due to flushing the bowels or lack of flushing before the operation. I suppose we all run into some complications, at certain times one kind, and at other times, others.

Dr. W. W. Gailey, Bloomington (Closing): Dr. Nugent has said that the visual results obtained in a given type of operation can not be considered as a sure criterion as to how well the operation has been performed. I think this point is well taken. In retrospection I can think of many incisions I have made which have been anything but classic. There are those cases where the iris is caught with the tip of the knife or those in which the anterior chamber has been thoroughly drained before the incision could be completed. There are those cases in which fixation has failed and the completion of the incision has been accompanied by a prayer. I can recall more than a few cataract extractions after which nobody could have been more surprised than I when it was found that an excellent end result had been obtained.

Dr. Nugent has criticized my method of extraction in that I used more pull than push but I would like for him to remember that I was" "showing off" in this picture. I use both the push and the pull, but during the progress of this particular extraction, I gave considerable thought to the photography and concluded that I might possibly fail to demonstrate how clever I was—in other words, I considered the possibility of the pusher being in the way. I could see the lower lens border tipping up and was fearful that my strabismus hook, by some chance, might interfere in making a presentable picture.

About irrigation, it may be that I irrigate too much but I certainly do appreciate a clean anterior chamber and must admit that I irrigated on this occasion more than was necessary. This might also be classed as a "show off" because I was quite desirous of showing the tumbling of the lens and it worked out very nicely.

As to eserine and atropine, I make it a practice to use eserine in round pupil cases and have had no reason to regret it. Some of my friends in ophthalmology use atropine in this type of case under the supposition that there will be less chance of the iris flooding into the wound. I am not, however, prepared to say which method is the method of choice as I have not used atropine immediately following a round pupil extraction.

Concerning vomiting—I am glad to state that in the past five years I have had only one case of pernicious vomiting which was accompanied by any serious complications. This case was operated on by me one week ago. Six hours following operation vomiting ensued accompanied by an extensive prolapse of the iris with choroidal hemorrhage. When the lids were opened one hour after vomiting had started, a clot almost as large as the globe itself, pushed its way out between the lids. The clot was excised, two sutures were introduced and the prolapse excised. It goes without saying there was a detachment of the choroid. As to the control of the vomiting, I must confess I was lost.

I have no remedy to offer for this serious complication. Someone has said that small doses of cocain or weak carbolic solution have a beneficial effect in these cases. Personally, I was completely at sea.

I have had a number of cases of vomiting in which the patient emptied his stomach as a drooling baby might without retching or straining, but this instance I have just described is the only serious case I have had occur in my practice.

It is my wish to thank Doctors Nugent, Meyer and Middleton for their kind words and praise of my picture and for their excellent discussions.

THE RADIOLOGICAL EXPLORATION OF SOME UNUSUAL FISTULOUS TRACTS

JULIUS BRAMS, M. D.

CHICAGO

The radiological exploration of fistulous tracts after the injection of various opaque media is a well known procedure. Both the radiologist and the surgeon are frequently surprised at the source, course and extent of an apparently simple fistulous opening or tract. So well known is this that a surgeon will not often attempt to excise or destroy a fistulous tract without first determining the complete extent of the tract. One need say very little about the choice of the opaque for the visualization of various types of fistulous tracts. The use of bismuth paste in bone fistulae, barium solution for fecal fistulae, the various iodized and brominized oils, the colloidal thorium solutions, skiodan solutions, etc., for the visualization of various types of "blind" fistulae are all well known. In our work the opaque oils have proved most valuable. Any of the common products of this group will be found satisfactory because they are all very opaque, of suitable viscosity, easy to inject, non-irritating and non-toxic, and frequently adhere to the tract wall so that the tract can be studied even after the oil has run out. No special procedure for injection need be described. Almost always a catheter or a cannula can be introduced into the sinus opening. The contents of the tract should be aspirated if possible so as to permit a complete filling with the opaque, and as a general rule it is advisable to warm the opaque before injecting it. Direct injection or flow by gravity may be used and the tract should be injected to the point of capacity indicated by back-flow around the catheter or cannula or by pain. It is always advisable to make the x-ray exposures in at least two projections or stereoscopically, and at times it may be advisable to repeat the examination if it is felt that the course of the tract has not been completely demonstrated.

We appreciate that nothing new is being added to this subject, but we felt that the unusual nature of the cases we are to present might stimulate an interest in this type of radiographic diagnosis and would therefore justify this report.

Case 1. Duodeno-biliary fistula. A white female, aged 72, came in complaining of abdominal pain which was constant but which was worse after eating. Nausea and vomiting were common especially after meals. The vomitus never contained blood but frequently the patient noticed pieces of food that had been taken several meals before. These symptoms were present for about four months and were getting worse. The patient had lost about thirty pounds in weight. The essential laboratory findings in this case were those of a rather marked anemia. The red count was 3,100,000 hemoglobin was 60%, and the white count was 9500. The physical examination was essentially negative except for some tenderness over the epigastrium and over the liver. A tentative diagnosis of carcinoma of the stomach was made and the patient was referred for x-ray examination. The latter revealed no evidence of any neoplasm. The stomach appeared quite normal, but when the duodenum was studied some of the barium was seen to pass up and apparently out of the bulb into the surrounding peri-

Fig. 1. Barium filled stomach and duodenum showing passage of the opaque meal from the duodenal bulb through a sinus tract to the common bile duct and up through the hepatic duct to fill the biliary tree. Some of the solution passes through the ampulla into the duodenum.

duodenal tissues. The film series on this patient showed a well filled and rather extensive duodeno-biliary fistula. (Figure 1.) The patient was not affected in any way by the presence of barium in the biliary tree and we made serial films after twenty-four hours and after forty-eight hours. Some of the barium solution was still present in the finer branches of the biliary tree after forty-eight hours, but we could not get the patient to return for further observation.

After the rather unexpected radiographic findings in this case the patient was questioned closely and then gave a rather reluctant history of having had an attack of very severe abdominal pain about a year previously. This lasted for several days and at least two doctors made the diagnosis of a gallstone colic and advised hospitalization. The patient refused and had quite a stormy course at home but finally recovered. Obviously, at the time of this colic, the stone was impacted and perforated to produce the duodeno-biliary fistula.

Case 2. Reno-cutaneous fistula. A white female, aged 23, came in complaining of bilateral lumbar pain. She stated that about a year previously she had a very severe left sided pyelitis from which she recovered in about a week. Four months after this she suffered a very severe attack of left lumbar pain which was associated with scanty urination and a fever. An x-ray study at that time showed the presence of stones in the left kidney. Since that time, that is for a period of about eight months, she has had almost continuous pain, fever and urinary disturbances. About two months ago she noticed a small nodule in the left inguinal region. This became swollen and painful and was incised. Ever since there has been drainage of pus from this wound. The physical examination in this case was essentially negative except for marked tenderness in the left lumbar region and along the left side of the abdomen. Repeated urine examination showed a faint trace of albumin, much pus, but no red blood cells. The patient was referred for x-ray study.

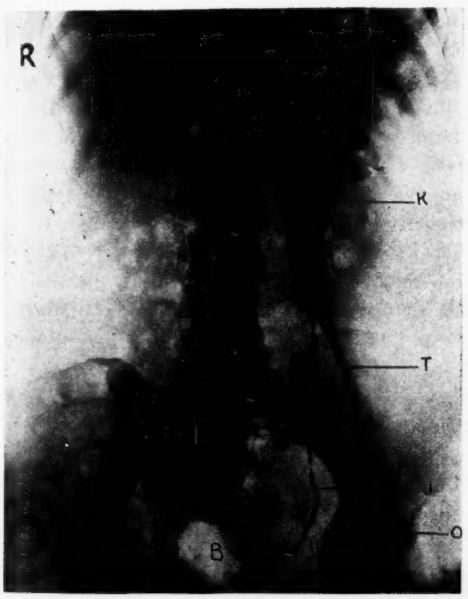

Fig. 2. Reno-cutaneous fistula. The opaque solution passes from the sinus opening "O" in the left inguinal region up through the sinus tract "T" to fill the kidney pelvis and calyx and then to pass down the ureter "U" and into the bladder "B."

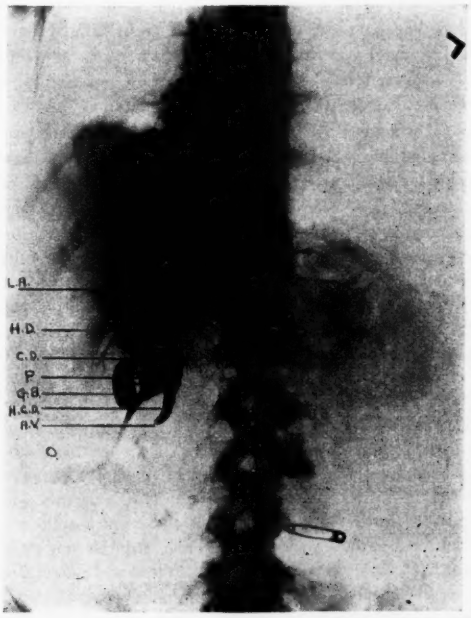

Fig. 3. Biliary-cutaneous fistula showing the passage of the opaque solution through the sinus opening "O" to fill the pocket "P" and from this site to fill the gall bladder "G. B.", the cystic duct "C. D.", the common duct "H. C. D.", the hepatic duct "H. D.", and then the biliary tree. In the liver area an irregular collection of the opaque solution is noted in the region of the liver abscess "L. A." Some of the opaque solution passes through the ampulla and into the small intestine.

Flat films of the urinary tract showed the shadow of a stone in the lower pole of the left kidney. In an attempt to explain the origin of the draining sinus in the left inguinal region we made exposures of the spine but these were negative. Unable to account for the fistula by anything we could see on the flat films we injected the tract with opaque oil. To the surprise of everybody the tract was found to have its origin in the kidney and the injected oil filled the tract to enter the kidney pelvis. From this point the oil passed down through the left ureter and into the bladder. (Figure 2.) Obviously the original source was a renal and perirenal infection with a perforation of the kidney substance, bur-

rowing of the infected material along the muscle planes, and pointing in the left inguinal area.

Case 3. Biliary-cutaneous fistula. A white female, 39 years of age, was first admitted to the hospital with a diagnosis of a pelvis peritonitis. After about three weeks of palliative treatment a large abscess in the right lower quadrant was drained. There was a marked discharge of pus for several weeks but the patient's condition gradually improved. Three months later the patient began to complain of severe right lumbar pain and frequency of urination. At this time the right kidney was definitely tender. Retrograde pyelography showed evidence of a pyonephrosis. The kidney was exposed through a right lumbar incision. Free and encapsulated pus was found in the perirenal tissue and the kidney itself was necrotic. A drain was inserted in the kidney bed and the wound was closed. Drainage was very profuse for several weeks, but the condition of the patient improved so that after about six months the patient was operated upon again and a subcapsular nephrectomy was done. Two weeks after this the patient developed a high temperature and a pain in the right chest. The clinical and x-ray findings were those of a subphrenic abscess. Aspiration yielded some blood tinged fluid but no free pus. The significant thing, however, was the fact that the sinus tract in the right lumbar region continued to discharge pus even after the nephrectomy. The patient was operated upon again and an attempt was made to resect the tract but this was not successful. After a period of about six months the patient again developed a fever and pain in the right chest. At this time about 500 cc. of fluid were aspirated from the pleural cavity. A diagnosis was made of a diaphragmatic pleuritis due to irritation from the persistent infection in the sinus tract and in the renal bed. At this time the patient was referred for x-ray exploration of the sinus tract. About 20 cc. of neo-skiodan solution were injected. Films made at the time of the injection showed the opaque solution running from the skin surface through the sinus tract into an irregular pocket in the renal bed. From this site the solution communicated with the common bile duct and filled the entire biliary tree. The smaller branches of the biliary tree were well visualized, the hepatic and common duct were filled well, the cystic duct was filled and the solution then filled the gall bladder. From the common duct the solution was seen to pass through the ampulla into the duodenum. In the liver substance the dye pooled irregularly in a well localized area. This had the appearance of an area of liver necrosis with perhaps some abscess formation. It may be of interest to note that this patient recovered after several months and left the hospital with the sinus tract closed.

These three cases amply demonstrate the unusual findings which may be demonstrated by fistulography. Equally unexpected findings will be discovered if this procedure is used more often. In our experience we have been able to obtain valuable information in cases of perirectal and periurethral tracts, in various types of abdominal and fecal fistulae, in fistulous tracts originating from some bone pathology, in exploring the extent of pilonidal cysts, etc. We have never seen any ill effects from this procedure and know of no contraindications.

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BILE PERITONITIS WITH CASE REPORTS

R. E. Lee Gunning, M.D.

GALESBURG, ILL.

Primary biliary peritonitis is a rather rare surgical entity, very seldom correctly diagnosed preoperatively. It is characterized by a rather sudden onset of abdominal pain usually epigastric at first and later localizing in the lower right abdomen, by vomiting, by either diarrhea or constipation, by a fever of 100° to 102°, by the rather rapid development of evidence of intraperitoneal fluid, and by the later onset of the formidable picture known as secondary surgical shock or "shock syndrome".

The first detailed description of this entity was by P. Clairmont and H. Von Haberer in 1910.[1] A number of scattered reports of cases have occurred since. Butkiewiez,[2] in 1936, collected from the literature 124 cases and reported 9 personally observed cases.

The exact etiology is not definitely known. Some form of liver or biliary tract disorder is probably preexistent. Sixty per cent of the cases have had gall stones. The common duct and papilla were totally occluded in only 10 cases. A rather extensive amount of experimental work has been produced chiefly in the form of obstructions to the bile flow and the injection of bile or bile salts into the peritoneal cavity of experimental animals. Free liver tissue itself, also, has been placed in the peritoneal cavity. Some recent work[3] would tend to prove that trypsin plus the activating effect of bacteria, leucocytes and cellular degeneration within the bile passages will experimentally produce an increased permeability of the walls of the bile passages with a resultant non-perforative biliary peritonites. Biliary peritonitis has been reported in all ages. It is more common in women by a ratio of nearly 2 to 1. In over half the reported cases there

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were previous symptoms of months or years of abdominal pains. In less than 10%, was there a history of gall stone colic.

Pathologically, there is an enormous collection of bile stained fluid in the peritoneal cavity, sometimes totalling as much as 3% of the body weight. The fluid has plasma-like characteristics and tends to spontaneous clotting. Bile has been found in the walls of the gall bladder and biliary passages, thus indicating the direct passage of bile salts through these wall structures. An increased permeability of the blood vessel walls of the peritoneum produced by the irritant action of the bile results in the excessive collection of the intreperitoneal exudate. If Butkiewiez' contention that the etiology is trypsin plus bacterial activity in the biliary passages, then we must presuppose some infectious process plus a reflux of pancreatic secretion into the common duct. The findings at operation and at autopsy do not bear out this combination of conditions in all cases.

At autopsy, besides the peritoneal fluid, there is found a marked concentration of the heart blood, petechial hemorrhages in lungs, brain and gastro intestinal tract. There is some form of associated biliary tract disease such as gall stones, cholecystitis, or duct obstruction in about 65% of the cases.

The associated condition of surgical shock syndrome has occasioned both experimental and thoughtful effort for explanation. It seems that it is due to the rapid dehydration of the general body tissues produced by the excessive exudate of the plasma-like fluid into the peritoneal cavity. A similar shock syndrome[3] has been produced by the subcutaneous injection of bile salts,[4] by the subcutaneous implantation of liver tissue, by burns, freezing and other similar traumatic agents. In all of these conditions, there is a loss of plasma-like fluid into the injured tissues. It has been shown that by experimental plasmapheresis, the loss of 4% of the body weight will produce death.[5]

The symptoms are those of an acute intra-abdominal episode. There may or may not be a history of preceding attack of epigastric pain. The onset is usually acute with epigastric or right upper abdominal pain. The abdomen, at first flat and tense, becomes increasingly more distended and painful on pressure. Tenderness, at first in the upper abdomen, frequently becomes localized in the lower right quadrant. Evidences of intra-abdominal fluid are only occasionally elicited. Vomiting is the rule and usually rather severe. Constipation, if present early, later gives way to diarrhea. The temperature, at first elevated to 101° to 102°, later in the course of the disease becomes either normal or subnormal. The development of the fluid is much more rapid than in other forms of peritonitis.

The white blood count is elevated throughout and, as the peritoneal fluid increases, the evidence of dehydration is seen in the high hematocrit reading in the red blood cell count as well as in the leucocyte count.

The diagnosis is not easy; nor is it often made before operation. The surgeon must usually be content to have diagnosed an acute surgical abdomen and treat the condition by an exploratory operation. The usual diagnosis made in biliary peritonitis is acute perforative appendicitis. The condition may simulate acute gall stone attack with secondary local peritonitis, acute perforation of the biliary tract, perforated duodenal or gastric ulcer, or acute pancreatic disease. The condition does not usually reach its acme for three or four days and thus, if biliary peritonitis be kept in mind, all of the above with the exception of perforating appendicitis may be ruled out. The extremely rapid accumulation of the fluid in biliary peritonitis as compared to any other form of peritonitis and the rapid developing evidence of dehydration noted both clinically and in the blood findings are the most help in differential diagnosis.

The prognosis is not good. The mortality in the cases so far reported has been 32%, approximately the same as in perforative disease of the biliary tract. There seems to be no record of morbidity. The cases which have recovered have remained well and there is no report of a recurrence.

The treatment is surgical. Early laparotomy with exploration and the institution of intraperitoneal drainage is of primary importance. Formerly, all intra-abdominal exudation or perforative lesions were uniformly drained. Recently, there has been a marked departure from this principle and drainage has become a rarity. It would seem from the reported results in non-

perforative biliary peritonitis drainage is essential and curative. Appendectomy is usually routinely performed, because the cases are usually operated on under the mistaken diagnosis of appendicitis. Gall bladder drainage, if the patient's condition permits, would seem logical as it offers a line of lessened resistance for the escape of bile.

Much more important, it would seem, even than the surgical measures is the management of the shock syndrome accompanying biliary peritonitis. The replacement of the lost blood volume due to the rapidly developing peritoneal exudate is all imperative. Intravenous 5% dextrose in Ringer's at present seems to be one best aid. Intravenous colloids and transfusions might seem advisable. General shock measures such as inverted Fowlers and circulatory stimulants are, also, indicated.

The following case report with operation and recovery is added to the literature. It is the only case of non-perforative biliary peritonitis occurring during pregnancy that we have encountered in the literature.

Mrs. L. K., a white woman, aged 19 years, was admitted complaining of vomiting and pain in the right, lower quadrant of the abdomen.

Except for two attacks similar to, but milder than the present illness, she had always been well. She had one child one year of age who was well. Her last menstrual period occurred seven months previously. Her pregnancy so far had been normal and she had felt motion about three months previous to entry.

Thirty-six hours before admission, she took an Ex-lax tablet because of mild constipation; within a few hours after this she began to have epigastric pain somewhat colicky in character and almost immediately followed by nausea and vomiting. The pain gradually became more severe and more constant; it did not radiate, nor was it influenced by the ingestion of fluids. About ten hours before admission the pain shifted to the lower, right quadrant of the abdomen and had become increasingly severe till at admission when it was not influenced by ¼ gr. of morphine sulphate. Vomiting had been constant since the onset and consisted of fluids ingested and some bile. There was no blood. She stated that she had felt no fetal movements since the onset of the attack thirty-six hours previously. Her bowels had been loose, but without diarrhea; her kidney function had been normal; she had had no chills and she had not felt feverish.

Except for the two previously mild but similar attacks, the past history was non-contributory.

The examination revealed a moderately obese, white female obviously suffering severe abdominal pain. Her temperature was 99.2°, pulse 96, respirations 26, and blood pressure 120/80. The physical examination was entirely negative with the exception of the abdomen. The abdomen was distended and somewhat tender throughout, but quite exquisitely tender over the lower right quadrant. Muscular defense and rebound tenderness were present in this latter area only. The uterus was the size of a seven month's pregnancy and seemed to be in constant spasm. No fetal movements were noted and the fetal heart tones were not heard. Vaginal and rectal examination confirmed the diagnosis of pregnancy, but gave no further information.

Examination of the urine was negative. The blood showed a hemoglobin of 93%, red blood cell count of 4,580,000, and a white cell count of 26,200. The smear showed 96% polymorphonuclears. Kahn was negative. The icteric index was 8.3.

A diagnosis of acute appendicitis was made and she was taken to the operating room and, under ether narcosis, the abdomen was opened in the lower right quadrant. On opening the peritoneum, there was a forceful gush of a large quantity of bile stained, non-odorous fluid. There was no gas with the fluid. An exploration of the biliary tract revealed the liver normal in size and consistency. The gall bladder was about twice its normal size and under moderate tension, but collapsed on pressure. No stones were present. The ducts were normal and intact. The stomach was normal. The seven month's pregnant uterus and adnexa were normal. The appendix was enlarged to three times its normal size, was kinked and bound down by adhesions evidently from previous inflammatory diseases. It was normal in color and showed no evidence of acute disease. It was removed and the wound closed in layers with a rubber tissue drain down to the peritoneum. The peritoneal fluid, unfortunately, was not sent to the laboratory for examination.

She stood the operation well and was returned to her room in good condition. About an hour postoperatively, she went into profound shock. The pulse became very feeble with a rate of 150 to 160. The respirations rose to 40. The temperature was 102°. Shock measures were instituted and subcutaneous and intravenous fluids were started. Caffeine sodium benzoate and coramine, also, were given. She responded fairly well and, after about six hours, the temperature dopped to 101°, the pulse to 116, and the respiration to 22. Eight and one-half hours postoperatively, she delivered a female infant which lived two hours. Twenty-four hours postoperatively, the temperature was 100°, pulse 92, respiration 20 and she looked very much improved. Intravenous fluids and morphine now were the only treatment being given. On the third day postoperatively, she began to have frequent watery stools. The vomiting had been checked by a Wangensteen aspiration set. In spite of opium and starch enemas, the diarrhea continued until the eleventh postoperative day. On the seventh postoperative day the wound suddenly drained a very large quantity of the same type of fluid as seen at operation. This lessened in amount, but continued to discharge until the fifteenth postoperative day. After the sudden onset of the drainage, she made rapid improvement and was dismissed from the hospital in good condition on the

fifteenth postoperative day. She was last seen three months after the operation and considered herself well.

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DISCUSSION

Dr. John A. Wolfer, Chicago: The subject of biliary peritonitis is very interesting from the standpoint of an analysis of its etiology. I have not had much experience in biliary peritonitis, I am glad to say, because this condition is not seen very frequently, but I have been interested in the mechanism of its production. Some five or six years ago following an observation in the operating room of an individual who had a very large tense gall-bladder which looked as though it were an acute phlegmonous cholecystitis, fat necrosis and pancreatitis, the gall-bladder was removed and microscopic section showed there was extensive necrosis and round cell infiltration, but the cultures from the contents of the gall-bladder and from the walls of the gall-bladder were all sterile. It seemed strange to me why there should be such extensive disease of the gall-bladder without any bacterial invasion. It happened at a time when we were thinking of bile as a causative factor in pancreatic disease. I wondered at that time whether there might be a reverse of the situation and instead of bile entering the pancreas to produce pancreatitis that pancreatic juice might enter the biliary tract and cause disease. Whereupon we started a series of experiments on dogs. We placed a cannula in the pancreatic duct and a T-tube in the common duct, and connected the two outside the abdominal wall using a glass observation bulb. In all the experiments that were successful there was always a flow from the pancreas to the biliary duct system. That bears out the observation of Harms that at the height of digestion the pancreatic secretory pressure is higher than the biliary pressure. In all the experiments in which we conveyed the pancreatic juice into the biliary tract there was found disease of the gall-bladder. In some instances there was found very extensive destruction of the gall-bladder up to complete necrosis. We also frequently found cases of acute cholecystitis in which the dog would become suddenly ill and die, and we would find the abdomen full of bile stained fluid, such as Dr. Gunning reported. It is interesting to note that some of these gall-bladders that looked practically normal at autopsy, showed extensive necrosis on microscopic examination. Blad several years ago reported similar observations. We felt at the time that there was a distinct association between pancreatic juice entering the biliary tract and acute gangrenous and phlegmonous cholecystitis because we were able experimentally to produce the typical pathological picture.

Now the question arises, in the human can pancreatic juice enter the biliary system. As we study the embryology of the pancreato-biliary system, we find that the pancreas arises from two buds, the dorsal and ventral. The smaller or ventral bud appears in the caudal angle between the gut and the liver diverticulum. Often this ventral pancreatic bud comes off directly from the hepatic tube and as the common duct lengthens it carries away with it the duct of that portion of the pancreas (illustrated by slides). The larger portion or dorsal bud arises on the dorsal side of the gastrointestinal stem at a slightly higher level. With rotation of the gastrointestinal stem the smaller or ventral portion of the pancreas will be found lying adjacent to and inferior to, the larger dorsal portion. Fusion of the two parts takes place while the duct of the dorsal pancreas is still the major duct. After fusion of the two portions of the pancreas, the ducts become connected, the ventral duct becoming the larger, the duct of Wirsung, while the dorsal atrophies to form the duct of Santorini.

Therefore, from an embryological point of view we can readily understand that there may be marked variations of the junction of the common duct and the duct of Wirsung. This slide shows the various possibilities: the high junction with the common duct above the ampulla, and the lower one with the pancreatic duct emptying into the ampulla and finally a separate entry into the duodenum with the formation of a spur. We can readily see from these pictures that it is possible with some types of communication to have a common pathway, the pancreatic juice entering the common ampulla and mixing with the biliary fluid. We have proved by experiments in which we introduced India ink into the observation bulb outside the dog's abdomen in a pancreato-biliary intubation that some days later the India ink was found in the gall-bladder, indicating that India ink placed in the bulb was carried with the pancreatic juice into the common duct and from the common duct into the gall-bladder. Now the question is, does pancreatic juice affect the living gall-bladder? Here is a cross section of a gall-bladder twenty-four hours after 10 c. c. of pancreatic juice had been injected into the common duct of a dog, showing extensive necrosis. It was 4 mm. or more in thickness, a typical instance of necrosis. Here is the photomicrograph of the gall-bladder six days after pancreatic juice had been conveyed into the common duct. This gall-bladder looked normal but on microscopic examination there was very extensive necrosis of its wall.

Prior to this time some experimental work was done by Westphal and Schoenbauer in Germany with the same results. Dr. Andrews at the University of Chicago has shown if you introduce ordinary pancreatic juice into the gall-bladder, invariably there follows extensive changes in the wall of the gall-bladder. If you inject pancreatic juice that has been put through a Berkefeld filter, mild reactions follow.

This would indicate that bacterial contamination may play a decided role in the process. Popper has definitely proved, in my opinion, that the amylase found in the peritoneal fluid in cases of acute biliary peri-

tonitis, reaches the peritoneal cavity by way of the duct and not by the blood stream.

There is some question relative to the mechanism by which the gall-bladder contents pass through the wall of the gall-bladder. Blad is of the opinion that there is sufficient destruction of the wall of the gall-bladder to allow the process to take place. Others believe that the wall of the gall-bladder becomes permeable to its contents, thus allowing bile salt and perhaps other substances to pass through, thus producing the pathological picture.

Dr. Paul H. Harmon, Chicago: I would like to briefly show some slides. When bile peritonitis is produced experimentally, changes in the blood are about the same as in other conditions of surgical shock. When surgical work is carried out on these patients they should have supportive measures: blood transfusion, plasma transfusion or acacia solution given intravenously. Intravenous infusions of saline or glucose solutions are less preferable.

The first slide shows the blood pressure record of a dog in which bile peritonitis was induced by intraperitoneal injection of bile salts. You can see the progressive drop in blood pressure over three hours, resulting in death some six hours and six minutes following the injection of this material. When bile salts or any biliary preparation is introduced intravenously there is an immediate drop in blood pressure with an immediate restoration to normal. These animals usually recover.

If one follows the concentration of the blood by means of hematocrit readings one finds the same as in other surgical shock: readings will be increased in exact proportion to red blood cell counts, meaning that the patient should be treated by something that will return the blood pressure and blood counts to normal. Several transfusions were given to the dog of this graph, restoring the blood pressure to normal, then a final drop to a lower shock level occurred with death. This is not an uncommon picture when shock has been present for a sufficient length of time.

We saw but one instance of biliary peritonitis in man but the shock picture was the same. In man cultures yielded B. coli. The colon bacillus produces a substance that gives a drop in blood pressure. The fluid injected from the peritoneum in man produced a marked drop in blood pressure.

ILL-ADVISED NASAL SURGERY

H. L. Ford, M. D., F. A. C. S.

CHAMPAIGN, ILL.

If it be true that nasal surgery is today in such disrepute as numerous writers and members of our own profession would have us believe, why, we ask ourselves, have we (members of one of the oldest surgical specialties) attained such a high degree of imperfection? The saying "once a sinus, always a sinus" is surely not based entirely on a misconception. Surely the family physician who advises his patient not to have his nose operated upon must be guided by previous unsatisfactory experiences with nasal surgery.

Granting that we face a more difficult problem than the general surgeon, namely, the restoration to normal function of abscess cavities, which must remain open and properly ventilated without kind nature's aid in the collapsing of the abscessed wall with obliteration of its contents following surgical drainage, are there not other factors to be considered?

I am sure that *lack of standardized surgical procedure* for definite pathologic entities should rank high as one definite factor, leading essentially to incomplete nasal surgery. This is probably mainly due to lack of uniformity in resident and postgraduate instruction. As practitioners of the present generation, there is little now that we can do about this. However, with the more recent general appreciation of this fault in postgraduate instruction let us hope that the future generation of specialists will realize more fully than the average specialist, graduated ten and twenty years ago, the specific indications for a certain type of ethmoid, maxillary, or frontal sinus procedure. "Shall we do a Mosher, Sluder, Ballenger ethmoid operation in a given case?"[1] In the words of Skillern, in speaking of ethmoid operations. "Age cannot wither, nor custom stale their infinite variety." One school or outstanding surgeon recommends this procedure, whereas another disagrees; and finally the seeker after knowledge learns to decide for himself and choose that procedure which he personally has found cures the greatest number of his patients.

Shall we resect the middle turbinate or not—is the preservation of the physiologic function of moistening, cleansing, and warming the inspired air to be stressed to such a degree that we leave a swollen, diseased concha bullosa after ethmoid exenteration—only to cause further trouble and eventually lead to another operation? You say this is purely a question of surgical judgment, to which I say, "Yes," but teaching of embryo surgeons should be more explicit, with more stress being put on painstaking study in diagnosis and proper appreciation of the definite indications for various surgical procedures and their modifications.

In an acute, closed empyema of a frontal sinus,

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wherein the lateral roentgenogram shows an angulated, narrow floor encroached upon by anterior ethmoid cells, should we trephine externally for drainage and irrigation, should we merely infract the middle turbinate and treat conservatively, fearing a meningitis if we did more, only to find that our patient goes on to a frontal lobe abscess, generalized meningitis and death? Should we do an intranasal frontal sinus operation using the rasp and thereby most likely produce in the end a complete stenosis of the naso-frontal duct; or should we, after deciding against the external trepanation, conclude that our best chance of success lay in resecting the tip of the middle turbinate and cleaning out the agger, infundibular and fronto-ethmoid cells. Personally, I should probably choose the external trepanation under the brow, irrigating through the retained rubber tube until the acute symptoms subsided and the naso-frontal duct became again patulous. If for any reason I did not follow this procedure, I should probably take my chances with the anterior ethmoid approach intranasally, leaving off the rasp. If the case is one of frank empyema of more than ten days' standing I feel that temporizing by mere infraction and argyrol tampons, etc., is definitely dangerous to the patient. There are times when conservatism is extreme radicalism. Such reasoning and deductions—which I grant are possiply not in accord with your ideas as to correct management of the case cited, I do not recall having been taught during my residency or early post-graduate work, or having read in any one text. My solution of this problem, as well as many others, represents a certain amount of study, visiting of various clinics, observation of results obtained, the discounting of overzealous advocates of original or modified procedures and, above all, the taking into account my own successes and failures in the handling of similar cases. If this is called "surgical judgment," then I feel that the time is certainly propitious for some five or ten eminent authorities in our field to get together and write a book on "Rhinologic Surgical Judgment," thereby giving us the benefit of 300 years' experience rather than 15-30, by which most of us practice our specialty. Such a text might also be called "The Sinus Problem—Collectively Approved Canned Experience."

Important as it is, however, lack of standardization of surgical procedures is, I feel, secondary to one other factor, namely, *ill-advised nasal surgery* in the sense that, while the case may be surgical, the operation performed is not the procedure of choice for the pathology present or as a matter of fact the wrong sinus is operated upon—a submucous resection performed when the patient needed an antral window, or other comparable errors made. This can not but lead to repeated operations, unnecessary destruction of tissue and, finally, failure to relieve the patient of his complaint.

Foremost in this proposed text on canned experience, I should like to see listed the indications for submucous resection per se. Foremost among them, I am sure, we would not find vacuum sinus headaches and catarrhal deafness. Mind you, this text is to be a medical treatise and not a text on economic trends and principles.

It is my belief, based upon my own personal experience, that ill-advised surgery is due to lack of complete and detailed understanding of the case at hand, a lack of thoroughness in working up the case and a hasty evaluation of the findings presented. This factor, granting we are of average intelligence, and not too lethargic, is within our power to rectify. If it depends upon proper evaluation of signs and symptoms presented by the patient, properly conducted examination, laboratory and clinical study available, then it must resolve itself into a problem of correct diagnosis. Given a correct diagnosis, with the institution of indicated remedial measures, the patient should be headed toward recovery. It is in this connection that I desire to call attention to a few related points of clinical and practical importance in the hope that they may stimulate thought and discussion on your part and in the conviction that I, in turn, shall improve myself by the study and reflection incident thereto.

May I first of all point out probably the most frequently operated on of all non-operative nasal disorders, namely, allergy, per se. The water-logged nose with its recurrent polypi has added much to our reputation as perennial surgeons. While removal of obstructing polypi is often necessary, the problem is essentially one for the allergist. I feel safe in saying that my nasal surgery has fallen 20% since I have come to realize the importance of allergy. Ignorance was not without its compensation from a finan-

cial point of view. Philosophically, however, the internal revenue department gets less and my patients are certainly immensely better off. I can not but think of the innumerable times, however, I unknowingly contributed to the ill repute of rhinologic surgery in that pre-allergic season.

Despite the frequent criticism that allergic tests are notoriously unreliable, diet restriction and desensitization often unsatisfactory, the fact remains that cytologic examination of the nasal discharge reveals in an amazingly larger number of suspected sugical cases, a preponderance of eosinophiles on the slide and the search must go on for the offending agents, while the patient is saved a trip to the operating room. Zinc ionization (iontophoresis) in spite of its producing of fibrosis with diminution of edema and vascularity, has certainly not received the stamp of collective approval as a means of treatment in such cases.

In this same category, McLaurin,[2] after a comprenhensive review of the literature on paranasal sinus disease and chest conditions, lists the indications for sinus surgery in *asthmatics* as follows:

"1. Sinus disease that would demand surgery, regardless of the existence of asthma.

2. Cases where the removal of polyps, or simple methods of drainage and ventilation, have helped the asthmatic state, but where such measures will not completely eradicate the sinus disease.

3. Cases in which recurrent attacks of rhinitis with exaccerbation of the sinus disease serve to precipitate attacks of asthma.

4. Cases in which the patient has been proven sensitive to his own infection, but the local sinus pathology would not ordinarily require surgery.

5. Where sinus disease exists and it has been found that attacks of asthma can be relieved by cocainizing the sphenopalatine ganglion."

In the history of the individual patient let us recall that there are many other causes of *headache* than sinus disease.[3] The most frequently overlooked is that of a latent eye muscle unabalance. *Exophoria,* so common, a frequent cause; and *hyperphoria,* less common, though most always producing a headache. Other ocular conditions—ametropia, early presbyopia, accommodative insufficiency and the dull ache of retinal fatigue. Careful refraction with phoria tests, and treatment for an existing imbalance are here essential—not a submucous resection to relieve a supposed vacuum headache (not as important a clinical feature now as in the past). However, we must realize that muscle imbalance is due very frequently to sinus disease; that ocular and sinus headaches co-exist. Notwithstanding this, however, we frequently find that the use of proper glasses cures headaches which have resisted one or more operations on the sinuses. A small error of refraction may account for a severe headache.

The patient's general *constitutional state* furnishes the clue oftimes to the cause of his nasal obstruction, as witnessed particularly in the hypo-thyreoid. A blood Wassermann not infrequently keeps us from sticking our necks in the proverbial direction.

It would be difficult to improve upon the excellent classification of the essential factors in establishing a diagnosis of sinus infection given by Canfield before the academy in 1922. In the order of their importance he enumerates them as follows: The clinical examination, the x-ray, transillumination, the history, the symptoms. He further divides the clinical examination in the following manner: The general appearance of the interior of the nose; the condition of the nasal mucous membrane; the presence of predisposing factors; the condition of the lateral nasal wall; the presence of discharge, its character, location, and amount; the effect of change of posture; the effect of shrinking of the mucous membrane; the presence of polyps; the recognition of the sinus or sinuses involved; the use of the probe; the use of suction; the bacteriologic examination; the exploratory puncture; the condition of the nasopharynx; the condition of the tonsils and teeth.

To this outline we might add the nasopharyngoscope and stereoscopic and radio-paque roentgenography.

A word or two relative to some of these procedures:

While transillumination is very often of great aid in affording positive corroborative evidence of sinusitis, it not infrequently is definitely misleading—both in antra and frontals. For the latter particularly, it cannot be compared with the reliability of x-ray.

While it is too much to expect the rhinologist to be a specialist in all the branches of medicine, yet I feel that we should be sufficiently versed in the field of roentgenology to give proper instructions to the x-ray technician to obtain what we desire on the film and to make the final diagnosis of what the film together with the clinical picture records. Roentgenology, while it may have cer-

tain limitations, particularly in disclosing ethmoid and sphenoid pathology in some cases, is to my mind our greatest single aid in pre-operative diagnosis. In the words of Campbell Smyth—"the diagnosis is on the film awaiting you."

This, however, providing it is a properly taken film. To those who have not studied the text on radiography of the "Nasal Accessory Sinuses" by Frederick M. Law[4] of the Manhattan Eye and Ear Infirmary, I sincerely recommend its purchase and frequent review. No rhinologist can afford to be without access to the information contained within its covers. Having familiarized ourselves with this text or one similar, we are then in position to realize the importance of stereoscopic plates, proper and improper positioning of the patient, the need of a fine focus tube with screens not too fast, and why pictures taken without a Bucky diaphragm best reveal mild pathologic changes, whereas those with Bucky are best suited for anatomic details desired, as in the basal or submento-vertex view. Many all-important facts are lost to the man who does not appreciate the careful interpretation of a properly taken set of films. The anatomical structure and relationship of the frontal sinus and anterior ethmoids, and the relation of the angle of the floor to the choana, will determine the feasibility of entering the sinus by way of the intranasal route. Edema, rarefying and condensing osteitis can be recognized in the ethmoid cells. Much valuable information, indispensible for correct diagnosis, awaits us on the film.

In association with x-ray, a word about radiopaques. If one could really depend on the accurate interpretation of "signs of sinusitis"[5] thereby afforded, their diagnostic value would be beyond question. The sinus spaces should be filled after the removal of all possible discharge to prevent deception due to a mass of discharge simulating a polypus. The efficacy of the Proetz displacement method of radio-paque filling seems to be still somewhat of a mooted question. So many conditions interfere with the "acceptance" of the solution through a small ostium, that the negative test of "non-acceptance" is no absolute indication of infection; and if the radio-paque does enter the negative pressure which sucks it in it may also cause misleading congestive changes in the mucosa.

Speaking of sinus surgery, Sewall[6] says "the inability to discover the true focus, the removal of the wrong focus, or the incomplete treatment of the right focus, have brought a certain approbrium on the focal infection theory. Incomplete treatment of the right focus is practiced so commonly in connection with sinus disease that the specialists must take the onus of the lack of understanding on the part of many of the medical profession of the importance of sinus infection."

With regard to focal infection, let us have a common understanding. When we say we have eradicated all the foci of infection from the upper respiratory tract what we really mean is that we have removed infected tissue, drained or cleared out an infected cavity.[7] Following operation, let us realize that there may be organisms present on adjacent tissue which continue to live, multiply and elaborate toxins with the formation of a purely bacterial focus of infection, tending to keep up secondary systemic disease. In such cases, recovery must come from building up the patient's defensive forces, not from further surgery. Local vaccine therapy or vaccines made from a pathogen-selective culture may aid.

Before surgery, diet, climate and sunshine play an important role in the prevention and cure of sinus infection. Shea says, "the older my sinus patient happens to be the quicker I send him searching for the sun."[8]

In our surgical work let us keep anatomy and physiology ever before us—realize that an imperfect anesthetic frequently means an incomplete operation—that acute sinusitis is very rarely surgical and finally the admonition of Skillern,[1] when he said: "to deliberately rip out an ethmoid capsule for the purpose of removing an unlocated source of suppuration in the nose, is like putting one's hand into a basket of snakes to find an eel. You may be successful, but the chances are small; furthermore, you may get your hand badly bitten in the bargain."

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DISCUSSION

Dr. Joseph C. Beck, Chicago: I do not think that Dr. Ford need to have apologized for the title of his paper. I had a chance to see this paper, which Dr. Ford was kind enough to send to me. I would like to entitle it "Sinus Surgery Then and Now," from my own standpoint particularly. I must consider the remark made concerning the formation of a group of competent aurists and rhinologists, who would band together to write a volume on this work so that the younger men can safely say they know what to do in sinus disease. When he got through, if he did read it, which he would not, he would find in each case what he could best do. We of the earlier school had to do pioneer work, and might be ashamed of it. I am not. We had to feel our way through. Many of the conditions are not yet cleared up. But consider for instance the number of cases of hyperplastic or waterlogged noses operated on then, and now never, unless there are polypoid obstructions; there you must do something and oftentimes it is a minor operation for which the patient is grateful. But to try and cure that condition, which we had to do and did not get very far with it—that is a thing of the past.

One thing I have noted in papers presented is the paucity of posterior sinus disease. Why do they always talk about the antrum and the frontal sinus? Maybe they mention the ethmoids, but only the anterior, and so far as the sphenoids and posterior ethmoids are concerned, that is like the labyrinth in former days. We know they are important in the management of sinus disease. X-ray or bacteriologic examination or blood will tell us the underlying pathology in the sinus, but it really is a matter for biopsy, not with the naked eye but with the microscope, to see why so many failures are obtained. The bone pathology is very much neglected and poorly understood. The bones in the head are different from other bones. That is because we have in the maxillary sinuses the only place except the anterior portion of the ethmoid and the orbit, the only place where we have actual true periosteum supplying the bone. The internal lining of every cell in the ethmoid has a nutritional value to the bone, and it seems to be not well understood by men who are dealing with sinus disease, the underlying osteitis. The end result will be dependent upon what the pathology was. No X-ray with or without opaque substances can make a final diagnosis.

The author mentioned the Bucky diaphragm. You cannot interpret the sinus mucosa after study with that. The subject is very large, and he presented it very well.

Dr. Austin A. Hayden, Chicago: Dr. Beck can properly be called, if not the father of otolaryngology, at least the popularizer of it. While much can be gained in regard to ill-advised nasal surgery from the microscope, there is another place where even more definite information can sometimes be found, and that is in the courtroom, in the malpractice suit-nasal surgery that was not properly advised or at least did not result favorably.

In connection with what Dr. Beck has said and Dr. Ford has mentioned in his paper, let me say this about the bones of the nose. I recently had an experience with a case that had had a submucous resection done, and shortly thereafter—within four days—it was thought necessary to go in and remove some more of the nasal septum, whether bone or cartilage I do not know, but a very poor result was obtained. There was a considerable period of high temperature which was described in great detail to the jury, as was the loss of a large percentage of that man's septum, and it resulted in an unfavorable verdict for the doctor concerned. That is a case I believe of ill advised surgery —the attempt to re-operate in the presence of a septal abscess.

Dr. O. E. Van Alyea, Chicago: I enjoyed Dr. Ford's paper very much, and also Dr. Joe's remarks. There is a tendency in the literature at the present time toward conservatism in sinus surgery. There is also a tendency toward radicalism by certain operators throughout the country. There is no question but that both are right, and both have their points. I think this proposed symposium or publication which would include many of the fundamentals with which to guide us in rhinologic surgery is highly important and highly indicated at the present time. There should be some happy meeting ground for the two schools. The statement has been made that if surgery is done in the nose it should be thoroughly done—that if operations on the sinuses are to be performed they should be extensive enough to accomplish what one sets out to do. Sir Herbert Tilley said that in the presence of sinusitis we should use all means at our command to eradicate the disease, no matter what has to be done. The idea "once a sinus, always a sinus" is prevalent in the laity throughout the country and is not entirely founded on fiction; there is quite a basis for it. I think much of that can be traced to the Golden Decade following the war, when many men received a very meagre education in nasal surgery, and set out to be specialists without the proper knowledge. They were taught the technique of tonsillectomy and submucous resection and perhaps mastoidectomy, and then they set out to operate on all the patients they could find for these things. Some years ago at a meeting of the Chicago Laryngological Society, I heard the senior Dr. Andrews make a statement which perhaps he can recall, wherein he said once he invented a chisel for removal of the middle turbinate and he regretted that he had done so because it had encouraged an excessive amount of turbinectomies. I have followed his plan of leaving the middle turbinate alone in most instances, whereas previously I had thought it was a structure of minor importance. Recent research by several investigators has shown the importance of maintaining the contour within the nose; the middle turbinate and the structures beneath it. This has much to do with ventilation of the sinuses which drain into that area, and

that is no doubt due to the negative and positive pressure mentioned by O'Malley of London and McMurray of this country. Consequently it seems that removal of these highly important structures changes the conformation of the outer nasal wall and this tends to make chronic conditions in these patients. One other thing I would like to mention concerns the treatment of the frontal sinus. Dr. Ford, I think, did not speak of irrigation, which we believe is a comparatively easy and simple procedure. Irrigation of the frontal is just as safe and easy to perform as irrigation of the maxillary sinus.

Dr. A. H. Andrews, Sr., Chicago: This paper is far-reaching in the subject which it takes up. I would like to see the book that is proposed to give a concensus of opinion regarding the treatment of nasal conditions. I think there is no one here that would agree that it was of any value to him in the treatment of his own patients. I think there has been much ill-advised surgery, and I think I have done my share of it. I began studying medicine the year cocaine was discovered. There was no nasal surgery prior to that. After that, operations became very frequent and physicians ran wild on the subject of intranasal surgery. Later we have become much more conservative.

Regarding the remark about my invention of a chisel for the middle turbinate, and my having regretted it because men were encouraged to remove the middle turbinate when they did not know what else to do—a doctor from Omaha said he had one fault to find with it, it made middle turbinectomies so easy to do that it was a shame to take the patient's money. I have removed diseased middle turbinates, and when the patient came back there was a diseased antrum on that side. I have the feeling that it is a protection to that antrum, and when the turbinate is taken out the protection is removed. I would like to see a concensus of opinion on the subject of submucous resections of the septum. There are those who believe it should never be done. There are others who believe it should be done on the slightest provocation. I think there is a happy medium that is difficult to find. If a man knows how to make a success of his septal resections, he is justified in operating on a case that another man might not be justified in operating on at all. In other words, there are times when the patient would be better off to let his septum alone than to take a chance with an incompetent operation. As to transillumination being unreliable, I have seen so many transilluminators that are of no value that I wonder they are used at all, but if you will take a light that can be varied in intensity and small in area, it is going to give you a good deal of information that you need.

Dr. H. L. Ford, Champaign (closing): I wish to thank all the discussors very much, particularly Dr. Beck. I only wish he would give a course of a week's intensive review in pathology and advertise it sufficiently that we might know of it, because I think most of us are definitely weak in pathology.

THE TREATMENT OF GONORRHEA WITH SULFANILAMIDE

HOMER W. HUMISTON, M. D.
CHICAGO

Following favorable preliminary observations on the treatment of gonorrhea with sulfanilamide given by Herrold in April, 1937, before the Society of Experimental Biology and Medicine, I began to make observations on the use of this drug on clinic patients* with gonorrheal urethritis. Since that time further favorable reports have been made by Dees and Colston,[1] Herrold,[2] Reuter,[3] and Buchtel and Cook.[4] This study was begun May 1, 1937. All patients with chronic gonorrheal urethritis who were under treatment at that time were given sulfanilamide. In addition all new patients were given the drug.

This report includes 140 patients with gonorrheal urethritis who were treated with sulfanilamide. Eighty-eight of these patients were followed for varying periods after there was no demonstrable evidence of infection. There were 52 patients who either lapsed treatment or in whom the clinical result was unsatisfactory during the period of observation.

The treatment given was fairly standardized, as was also the procedure by which "cure" was determined. The dose of sulfanilamide was as follows: 45 grains daily for two days, 30 grains daily until gonococci were no longer found, and 15 grains daily until the course of provocatives was completed. During the succeeding period of observation no medication was prescribed. A mild urethral injection (usually 1:4000 neutral acriflavine) was administered anteriorly as long as the urethral discharge continued. A few of the earlier patients were given sulfanilamide, 30 grains daily, as an initial dose. We were able to see a quicker response to the 45 grain daily dose, but these cases are not separated in the analysis as the difference was not striking.

A diagnosis was made by identifying gonococci in every case before treatment was started. At each visit inspection of the first and second glasses of voided urine was made. When the first glass of urine became clear, smears of shreds from this source were examined for gonococci.

*From the Department of Urology, Northwestern University Medical School.

*These patients were treated at the Illinois Social Hygiene League, Chicago.

In many instances shreds were either absent or were too fine to be picked up on a wire loop. About two to three weeks after the clearing of the first glass of urine, or the last positive shred examination, a systematic course of provocative treatments was carried out. The prostate was examined digitally, a fresh smear of the prostatic secretion was examined for pus, and a stained smear for bacteria. The caliber of the urethra was checked with a diagnostic sound, and at successive visits instillations of ¼%, ½%, and ¾% silver nitrate were made. Following this, a subcutaneous injection of 0.5 cc. gonococcus vaccine was given, and an examination of ejaculated semen for pus and organisms was made. All of the patients described as "cured" in this report had the above course of provocative measures and a succeeding period of observation of from four to twelve weeks without evidence of gonococcus infection.

There were 40 patients with acute anterior gonorrheal urethritis of a duration of one to twenty days before starting treatment with sulfanilamide. Twenty-nine of these patients admitted previous gonorrheal infections. While taking sulfanilamide, three patients developed a posterior urethritis with the characteristic cloudy second glass of urine. These will be included among the group of patients with posterior urethritis. Nineteen of the 37 patients with uncomplicated anterior urethritis had a clear first glass of urine in less than one week. In the remaining 18 patients varying periods up to seven weeks were required to clear the first voided specimen, although only 4 patients of this group had any evidence of gonococcus infection after four weeks. Except for untoward reactions to the drug, there were no complications in this group. One patient had a clear first voided urine in three days, and gonococci were not demonstrated after three weeks of treatment. Three weeks later the series of provocative treatments was started. Following the subcutaneous injection of gonococcus vaccine there was a flare-up of the urethritis which subsided in two weeks, and the series of provocative treatments was repeated without another recurrence.

Twenty-nine of the 51 patients with posterior urethritis had a clear second voided urine in one week or less, 14 patients required from one to ten weeks, and 8 patients had a clear second urine when started on sulfanilamide therapy. Twenty-five of the 51 patients did not show any evidence of gonococcus infection after two weeks. The remaining 26 patients required up to eleven weeks of treatment before gonococci were no longer demonstrated.

In this group several complications of the disease were seen. Six patients developed acute epididimitis while taking sulfanilamide. Two additional patients had acute epididimitis when treatment was started. In all of these the course was very favorably modified as to duration and severity of the inflammation as compared with patients treated without sulfanilamide. One patient had an acute uveitis, which was assumed to be a metastatic gonococcus lesion. Smears from the conjunctiva revealed no bacteria. This complication arose during treatment with sulfanilamide and subsided in a few days. One patient had diffuse arthritic and muscular pains without acute arthritis when the drug was started. This was assumed to be gonorrheal in origin. He required eight weeks of treatment before the second voided urine was clear. The joint and muscular pains improved gradually and had entirely disappeared when gonococci were no longer demonstrated in the genitourinary tract.

About one-half of the patients complained of some degree of dizziness, drowsiness, nausea, weakness, or headache while taking the 30 grain or 45 grain daily dose. A few patients not included in this report could not tolerate 10 or 15 grains daily on account of the severity of the above symptoms, and were treated by other means. There were 4 patients with skin eruptions which developed during the course of sulfanilamide therapy. One of these improved without stopping the medication. In the other three patients the eruption disappeared after the drug was discontinued.

In this series none of the more serious complications of sulfanilamide therapy, which have been reported, were seen. It is possible, however, that they may have occurred without our knowledge among the patients who lapsed treatment.

In patients with gonorrheal prostatitis who were treated at this clinic without the use of sulfanilamide, it has required a period of weeks or months after gonococci were no longer demonstrated to reduce the pus content of the prostatic secretion to five or ten pus cells per high power field. In all the patients in this series who had not had a previous gonorrheal prostatitis, the

prostatic secretion was free of pus at the time of starting the provocative measures. In some of the patients who had had a previous gonorrheal prostatitis, there was often some residual prostatitis after gonococci could no longer be demonstrated. This was generally much less than had been observed prior to the use of sulfanilamide and generally responded in a few weeks to sulfanilamide and prostatic massage.

In 7 patients smears of urinary sediment from the specimen voided after prostatic massage were stained and examined. These examinations were made after gonococci could no longer be demonstrated in shred smears. In all of these patients gonococci could be found for several days or weeks after they could no longer be demonstrated by the shred smear method. The number of these examinations was insufficient to establish the length of time that gonococci persist after they are no longer demonstrable by the routine laboratory methods applied to this series of patients.

There is frequently a rapid disappearance of pus from the smears of urethral discharge and shreds from the first voided specimen, which is out of proportion to the number of gonococci still present. With the clearing of the first glass of urine, shred smears often reveal enormous numbers of gonococci and relatively few leucocytes.

Of the 52 patients who were not followed until cured, 12 patients with posterior urethritis were given sulfanilamide for a period of six to twelve weeks without substantial modification of the infection. There were 40 patients seen during the period this study was in progress who were very irregular in attendance or who lapsed treatment and were not observed further.

COMMENT

Eighty-eight male patients with gonorrheal urethritis were treated with sulfanilamide and followed to "cure" and for varying periods thereafter. Twelve additional patients showed practically no benefit from the medication in six to twelve weeks. It is felt that the clinical course of gonorrheal urethritis is definitely shortened by the use of sulfanilamide, that the incidence of complications is lessened, and that the occurrence of sequelae is greatly decreased. About one-half of those given sulfanilamide had minor reactions to the medication. No serious reactions were seen. A few patients were unable to tolerate the drug and were treated by other means.

However, it is recognized that serious reactions to this drug do occur, and it is felt that patients receiving sulfanilamide should be kept under close observation and the drug discontinued if untoward reactions occur.

6 N. Michigan Avenue.

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THE SPASTIC COLON DIET

E. E. Cornwall (Am. J. Dig. Dis. and Nutr. 3:773, Dec. 1936).

In supplying a smooth diet for the spastic colon, milk is the preferred food as a source of protein. The milk, or milk preparations, may be mixed with water, cereals, strained fresh fruit juices, and strained decoctions of vegetables. Cream and cottage cheeses are suitable, and rennin-made cheese such as American cheddar, Parmesan, and Edam may sometimes be used if properly comminuted and made smooth.

Other foods advised in the treatment of this condition include eggs, cereals and toast, sugars except cane sugar, butter, cream, olive oil, and ripe bananas, which are accorded first place among the acceptable fruits. A combination of ripe bananas and cream cheese is recommended as especially serviceable. Other fruits include orange, grapefruit, or pineapple juice, and baked and stewed apples. Smooth vegetables, raw tomato, water, and salt in moderation complete the diet. Spices, tea, coffee, and animal flesh are forbidden.

NIGHT BLINDNESS DUE TO VITAMIN A DEFICIENCY

A Consideration of Its Importance in Traffic Problems. H. Jeghers. New Eng. J. Med. 216:51, Jan. 14, 1937.

The importance of vitamin A in providing visual purple for the retina of the eye is discussed in this article, and a number of case reports of night-blindness, or hemeralopia, due to vitamin A deficiency are presented. These cases were quickly cured when given foods rich in vitamin A, such as butter, milk, and raw carrots, supplemented by administration of carotene.

The author believes that numerous cases of mild or moderate hemeralopia are responsible for defective vision of motorists and are the cause of many traffic accidents during night driving on dimly lighted highways. An extensive study of this condition among motorists and aviators would be worth while.

CORONARY THROMBOSIS VS. DISSECTING ANEURYSM IN DIFFERENTIAL DIAGNOSIS

L. Minor Blackford and Carter Smith, Atlanta, Ga. (*Journal A. M. A.*, July 24, 1937), report a case of dissecting aneurysm of the aorta that occurred in a highstrung, hypertensive, fat man, aged 61; the diagnosis was definitely made before necropsy. Death occurred from rupture of the dissecting aneurysm into the pericardium thirty-six hours after the original break through the intima. The long history of hypertension, the agonizing, tearing pain as though something had been "torn loose inside," the temporary loss of vision, the nausea, the vomiting, the shock, the murmurs at the aortic region and the absence of pulsation in one extremity, the period of relative comfort with the dramatic death on slight effort, and the rupture into the pericardium in this case were all typical of dissecting aneurysm of the aorta, as McGeachy and Paullin have recently pointed out. The diagnosis of dissecting aneurysm of the aorta should be made without difficulty, if it is taken into consideration in differential diagnosis. In spite of the rarity of the condition, therefore, it is exceedingly important to make the diagnosis to prevent too much being done and to keep the patient as comfortable and quiet as possible in the hope that he will recover with a double-barreled aorta.

DID NOT TAKE OFF HIS HAT

A salesman was driving along a country road one day when he saw a red-headed Negro child playing in front of a little shack sitting on the edge of a clearing. He had never seen a red-headed colored child before, so his curiosity was aroused. Stopping his car in front of the yard, he called out to the old colored mammy who was sitting on the porch:

"Is that your child?"

"Yassuh, he is," answered the mammy.

"Well, tell me something," he went on, "how did he happen to get red-headed?"

"He was borned lak dat," replied mammy.

"I can't understand that," said the salesman. "You certainly don't have red hair. Is there any red hair back in your family?"

"Naw suh, not a bit," replied mammy.

"Well, how about the father of the child, is he red-headed?" the salesman persisted.

"Ah don' know dat, mister," answered the mammy. "You see, dat gentleman didn't take off his hat."

FROM THE ETHICAL RELATIONS COMMITTEE OF THE AMERICAN MEDICAL ASSOCIATION

The following opinion was rendered by the Ethical Relations Committee with reference to the use of Neon signs by physicians:

"The display of Neon electric signs by ethical physicians is indicative of self laudation and defying the traditions and lowering the tone of our profession. As implied, it is unprofessional to disregard local customs and offend recognized ideals. Modesty and sobriety is indicative of our profession, while Neon electric signs savor of quackery."

GONADOTROPIC SUBSTANCE IN TREATMENT OF ACNE

Of the thirty-nine cases of acne vulgaris that Grace E. Williams and Ruben Nomland, Iowa City (Journal A. C. A., Aug. 21, 1937), treated, 85 per cent of those given gonadotropic substance from pregnancy urine showed moderate to marked improvement, while 78 per cent of the control group given sterile water showed the same degree of improvement. Although menstrual periods became more regular in nearly all the women given gonadotropic substance, they also became more regular in more than half of the patients of the control group. A correspondingly uniform improvement did not occur in the condition of the skin of those whose menstrual periods became regular. There were individual cases in which improvement of the skin paralleled the change from an irregular menstrual cycle to a regular cycle, but there were also individual cases in which this did not occur. The results show a slightly greater degree (7 per cent) of improvement in the acne of the group treated with gonadotropic substance from pregnancy urine compared with the control group. The difference is hardly sufficient, however, to justify the expense and effort of intramuscular administration of the gonadotropic preparation. It would seem that local therapy is the most important factor in the management of acne.

LOBELINE SULFATE: ITS PHARMACOLOGY AND USE IN THE TREATMENT OF THE TOBACCO HABIT

Because a drug which would enable the confirmed smoker to give up this habit without hardship would be of obvious importance, and because lobeline resembles nicotine so closely in many of its pharmacologic properties, Irving S. Wright and David Littauer, New York (*Journal A. M. A.*, Aug. 28, 1937), undertook to determine whether or not it possessed any of those very actions which interdict nicotine for patients suffering from disease of the peripheral circulation and whether its use could be safe in the routine "cure" of the tobacco habit. They find that lobeline sulfate in doses of 0.008 Gm. (one-eighth grain) orally is not suitable for general use as a "cure" for the tobacco habit. The symptoms are predominantly gastro-intestinal, variable from patient to patient, and in general too drastic in most individuals. Lobeline sulfate produces a nicotine-like effect on the peripheral circulation. In certain individuals a vasoconstriction with a drop in surface temperature occurs. This is not as constant, when the mentioned dosage and route of administration are used, as the effect obtained by smoking a cigaret. Lobeline (administered in the form of lobeline sulfate), like nicotine, produces an elevation in blood sugar in certain individuals. Further study with smaller doses may increase its usefulness for the purpose, but its widespread use should not be encouraged until such studies have been completed.

Every year is "leap year" to the pedestrians.

Say it with brakes and save the flowers.

To avoid that run-down feeling, cross crossings cautiously.

Society Proceedings

COOK COUNTY

CHICAGO MEDICAL SOCIETY

Wednesday, November 3, 1937

Regular Meeting

PROGRAM

RECENT DEVELOPMENTS IN THE TREATMENT OF DEMENTIA PRAECOX

The Program will be presented by Dr. Charles F. Read of the Elgin State Hospital and his associates and Dr. Major H. Worthington of the Research & Educational Hospital and his associates.

1. Film "Treatment of Dementia Praecox by Insulin Shock and Cardiozol".....Charles F. Read, Managing Officer, Elgin State Hospital.
2. "Insulin and Metrazol Shock Treatment of Dementia Praecox and other Functional Psychoses" (Illustrated by motion pictures).....A. A. Low, Ass't. Dir. Psychiatric Institute, University of Illinois College of Medicine.

DISCUSSION

D. Louis Steinberg, Elgin State Hospital.
Gert Heilbrunn, Elgin State Hospital.
H. Douglas Singer.
Ralph C. Hamill.

OGLE COUNTY

A November Meeting of the Ogle County Medical Society was held at the home of Dr. Warmolts in Oregon, Friday, Nov. 19, 1937.

Meeting was called to order by Dr. Warmolts and following the disposition of business, officers were elected for 1938. The officers of 1937 were returned to their respective offices.

Dr. Frank Rector, of Evanston, Representative of the American Society for the Control of Cancer, was introduced by Dr. Pettit of Ottawa.

Dr. Rector gave a very instructive illustrated talk on the Cancer Problem. Following the meeting, all were invited to partake of a luncheon.

A. R. Bogue, Secretary.

Marriages

Glen J. Allen to Miss Dona Luke, both of Peoria, September 25.

Evan Mansfield Barton to Miss Jane Purvis High, both of Chicago, October 16.

Gordon Taylor Burns, Chicago, to Miss Mildred Birmingham of Berwyn, Ill., October 9.

John Joseph Hanlon, Chicago, to Miss Mayme Mangan, in Evanston, Ill., August 31.

Phillip C. Hemming to Miss Janet R. Hawkins, both of Elgin, Ill., September 18.

Felicia D. Shlepowicz, Chicago, to Mr. Joseph M. Koch of Granite City, Ill., in June.

Personals

Dr. Paul H. Harmon, Springfield, discussed "Anterior Poliomyelitis," before the Madison County Medical Society, November 5.

Marion Hood, Ph.D., discussed "Trichiniasis" and Bertha Kaplan Spector, Ph.D., "Amebiasis," before the Chicago Council of Medical Women November 5.

At a meeting of the Chicago Laryngological and Otological Society, November 1, Dr. Morris A. Glatt discussed "Regeneration of Mucous Membrane After Sinus Operations."

Dr. Maurice I. Kaplan, among others addressed the Chicago Society of X-Ray Technicians November 4 on "Anatomy and Physiology of the Gastro-Intestinal Tract."

At a meeting of the Chicago Surgical Society, November 5, Dr. John Martin discussed "Ventricular Changes in the Presence of Intracranial Pathology, with Demonstration of Models."

The Chicago Pathological Society was addressed November 8 among others, by Drs. Paul R. Cannon and Theodore E. Walsh on "Potential Dangers of Intranasal Medication."

Dr. Charles B. Huggins, among others, addressed the Chicago Urological Society, November 18 on "Treatment of Tuberculous Wounds Followng Nephrectomy."

Dr. Frederick B. Moorehead, Chicago, discussed "The Use of Plastic Traction in Jaw Fractures," before a joint meeting of the Sangamon County Medical Society and the G. V. Black District Dental Society in Springfield, November 4.

At a meeting of the German Medical Society of Chicago, November 2, Drs. Leo J. Latz and Franklin E. Hall discussed "Recent Studies on Fertility and Sterility in Women," and "The Inverted Uterus," respectively.

A symposium on sulfanilamide was presented before the Chicago North Shore Branch of the Chicago Medical Society, November 2, by Drs. Bernard Fantus, John A. Bigler, George S. Livingstone and Russell D. Herrold.

Dr. Joseph A. Campbell, managing officer of the East Moline State Hospital, has been appointed acting head of the Anna State Hospital,

pending the appointment of a successor to the late Dr. Ralph A. Goodner.

Dr. Charles H. Starkel, Belleville, was honored October 25, when a fifty year Masonic membership jewel was presented to him by the Grand Lodge of Illinois. He has practiced in Belleville fifty-three years.

The Chicago Society of Internal Medicine was addressed November 22, among others, by Dr. Harold C. Lueth and Thrift G. Hanks on "Some Unusual Reactions to Nitroglycerin in Patients with Hypertension."

The Chicago Gynecological Society was addressed November 19 by Drs. Max Cutler on "Complications Associated with the Radiation Treatment of Cancer of the Cervix," and Edward L. Cornell and Dorrin F. Rudnick on "Clinical Manifestation and Treatment of Stricture in Women."

At a joint meeting of the Chicago Orthopaedic Society and the Chicago Roentgen Society, November 12, the speakers were Drs. Daniel H. Levinthal and Hollis E. Potter on "Benign Tumors of Bone—Diagnosis and Treatment," and "Roentgenological Aspects of Low Back Pain," respectively.

Loyola University School of Medicine has annexed the dispensary and outpatient clinical facilities of Mercy Hospital, 2536 Calumet Avenue, to supplement the overcrowded clinics at the medical school. Dr. John G. Powers has recently been officially appointed assistant dean of the medical school.

Howard J. Shaughnessy, Ph.D., has resigned as director of the division of laboratories of the Illinois State Department of Health, Springfield, to become associate professor of bacteriology and public health at the University of Colorado School of Medicine, Denver. Dr. Shaughnessy has held the position with the Illinois department since 1931.

Drs. Ralph M. Tyson and Chevalier L. Jackson, Philadelphia, discussed "Diagnosis and Treatment of Foreign Bodies in the Respiratory Tract," before the Peoria City Medical Society in Peoria, November 16. At a meeting of the society, November 2, Drs. Harry Costeff and Julius Steinfeld, Peoria, discussed "Insulin Shock and Other Methods of Therapy in Schizophrenia."

Dr. Rollo K. Packard, president of the Illinois State Medical Society, addressed the Jewish Physicians Fellowship Club of Chicago and suburbs on November 1, on the subject of "Medical Economics."

Dr. Henry Buxbaum presented two papers on obstetrics before La Salle County Medical Society on November 4, subjects, "Indications and Contraindications and Technique for Forceps Delivery," and "Indications and Technique for Cephalic and Podalic Version."

Dr. William B. Serbin and Harry Leichenger presented a program before Lee and Whiteside County Medical Societies on November 4; their subjects are "Repair of Obstetrical Injuries"; "Difficulties of Obstetrical Diagnosis," and by Dr. Leichenger, "Meningitis."

Drs. Paul H. Harmon of Springfield and W. J. Dieckmann of Chicago gave a program before Jefferson-Hamilton County Medical Society on November 5; subjects respectively, "Poliomyelitis," and "Indications and Contraindications and Technique of Forceps Delivery."

Drs. Charles B. Reed and Joseph K. Calvin presented a program before the Hancock County Medical Society on November 1, on "Medical Complications of Pregnancy" and "Treatment of Pneumonia."

Drs. LeRoy H. Sloan, C. C. Maher and Harold A. Sofield addressed the Tri-County Medical Society at Monmouth on November 2; their subjects respectively were "Correlation of the Clinical Picture of Acute Vascular Insults to Various Parts of the Body," "Hypertension," and "Operative Treatment of Residual Infantile Paralysis."

Drs. Julius Hess and Isaac Abt presented a pediatrics program before the LaSalle County Medical Society at Ottawa on November 9, on "Diseases of the Newborn," and "Management of the Newborn."

Dr. Italo F. Volini gave a paper on "Etiology of Heart Disease," before the Bureau County Medical Society at Spring Valley, November 9.

Dr. Robert S. Berghoff addressed the members of the Jefferson-Hamilton County Medical Society at Mount Vernon on November 11, subject, "Heart Disease."

Dr. A. F. Lash presented a program before Coles-Cumberland County Medical Society on November 4, subject, "Recent Advances in Management of Puerperal Sepsis."

Dr. Julius H. Hess was appointed a member of the Illinois Board of Pubic Welfare Commissioners by Governor Horner. The other members of the Board are Willoughby Walling, Charles Schweppe of Chicago, Rodney Brandon of Batavia and Mary Humphrey of Springfield.

News Notes

—At the November 4 meeting of North Side Branch, Chicago Medical Society, a very large audience was thrilled by a program featuring the Japan-China war. Dr. Robert B. Preble told of his hair-raising experiences during the accidental bombing of Shanghai, his escape by boat to Manila, and by air to Hawaii. Mr. G. H. Wang, Chinese Vice-Consul, detailed the causes underlying the war. And Dr. H. E. Davis displayed war scenes on the screen.

—The library at the University of Illinois College of Medicine has recently received two additions to its collection. Dr. William Allen Pusey, Past President, American Medical Association, presented a collection of some 1,500 selected books and an assortment of separates and reports in the field of surgery and surgical pathology. Hertzler, Halstead, Kan., gave a collection of about 7,000 volumes and 8,000 separates, largely in the leld of surgery and surgical pathology. Both collections are available to students and the medical profession.

—The sixty-third annual meeting of the Southern Illinois Medical Association was held in Pinckneyville, November 9. The speakers included:

Dr. Roland M. Klemme, St. Louis, Management of Head Injuries.

Dr. Marion L. Klinefelter, St. Louis, Early Treatment of Fractures.

Dr. Walter C. Alvarez, Rochester, Minn., Useful Hints in the Treatment of Indigestion.

Dr. Quitman U. Newell, St. Louis, Treatment of Prolapsus Uteri.

Dr. Leon Bromberg, St. Louis, Present Status of Artificial Heat Therapy.

Dr. William H. Olmsted, St. Louis, Protamine Insulin.

Dr. Frederick V. Emmert, St. Louis, Analgesia in Obstetrics.

Dr. Albert B. McQuillan, East St. Louis, Rarefying Conditions in Bone Disease.

—Dr. Morris Edward Davis, associate professor of obstetrics and gynecology, and Dr. Arthur K. Koff, formerly instructor of obstetrics and gynecology, Division of Biological Sciences, University of Chicago, were awarded the annual prize of $100 by the Central Association of Obstetricians and Gynecologists for the most meritorious work done by its members. Their paper is entitled "The Experimental Production of Ovulation in the Human." Dr. Davis won the Gold Medal Award for the best scientific exhibit at the annual session of the American Medical Association in 1935.

Dr. Alfred H. Washburn, director, Child Research Council, University of Colorado, Denver, delivered a lecture under the Elizabeth McCormick Child Research Grant of the Institute of Medicine of Chicago at a joint meeting of the institute and the Chicago Pediatric Society, November 16, at the Palmer House, on "The Place of Child Research in Medicine: Some Contributions to Medical Thought Suggested by a Study of the Growth and Development of the Individual Child." Dr. James B. Herrick, professor emeritus of medicine, Rush Medical College, delivered a public lecture under the auspices of the institute at Thorne Hall, Northwestern University, November 19, on "How Knowledge of the Heart and Its Diseases Has Developed."

—Colonel M. A. Reasoner, Medical Corps, U. S. A. of the class of 1899, delivered the Armistice Day lecture sponsored by the Faculty and Alumni of the College of Medicine of the University of Illinois.

—Dr. Corneille Heymans, professor of pharmacology and therapeutics, University of Ghent, Belgium, presented the Louis A. Greensfelder Memorial Lecture at the Rothschild Auditorium, Michael Reese Hospital, November 23, on "The Physiological Considerations of Surgical Intervention in Hypertension." Discussions presented by Drs. Harry Goldbatt, professor of experimental pathology, Western Reserve University School of Medicine, Cleveland, on "Surgical Application of the Physiological Principles in Experimental Hypertension"; Max M. Peet, professor of surgery, University of Michigan Medical School, Ann Arbor, and Alfred W. Adson, professor of neuro-surgery, University of Minnesota Graduate School of Medicine, Rochester,

Minn., "Surgical Application of Physiological Principles in Clinical Hypertension."

—Recent changes on the faculty of Loyola University School of Medicine include the appointment of Dr. William R. Cubbins as professor and director of a new division of bone and joint surgery; julius Sendroy Jr., Ph.D., as professor and head of a new department of experimental medicine, and the appointment of Dr. Henry Schmitz, head of the department of gynecology, as head of the department of obstetrics to succeed Dr. Bertha Van Hoosen, who becomes professor emeritus. Other changes include:

Dr. Thomas F. Finegan, professor of urology.

Dr. Robert E. Cummings, assistant clinical professor in pediatrics.

Dr. H. William Elghammer, clinical professor

Dr. William J. Pickett, associate clinical professor of surgery.

—The Birchwood Park Sanitarium has just purchased approximately $1,000 worth of x-ray equipment, it is reported by Dr. Herbert W. Gray, medical director, to increase the quality and range of its x-ray work in keeping with the recent change in emphasis to chronic ailments by the institution. The equipment will be of assistance to doctors who, under the new arrangement, desire to bring their patients to the Sanitarium for personal treatment.

Deaths

CLINTON ANTHONY BENZIE, Chicago; University of Illinois College of Medicine, Chicago, 1927; member of the Illinois State Medical Society; a physician for the child welfare bureau, city board of health; on the staff of St. Margaret's Hospital, Hammond, Ind.; aged 40; was killed, September 8, when he was struck by an automoblie.

FRANK MATHIAS COCHEMS, Chicago; Rush Medical College, Chicago, 1928; aged 35; died, August 1, in Mundelein, Ill., of acute coronary thrombosis.

HARLEY ROSS COLVER, Chicago; Rush Medical College, Chicago, 1904; medical superintendent of the Carnegie-Illinois Steel Corporation Hospital; aged 63; died, August 22, of coronary thrombosis and arteriosclerosis.

OSWIN FRED KOCH, Chicago; Bennett Medical College, Chicago, 1915; aged 54; died, August 25, of carcinoma of the rectum.

RUDOLPH JOHANNES KREMER, Chicago; Philipps-Universität Medizinische Fakultät, Marburg, Prussia, Germany, 1923; assistant professor of pathology, University of Illinois College of Medicine; served with the German Army during the World War; aged 40; director of the pathological laboratory of the Augustana Hospital, where he died, August 14, of mitral stenosis, rheumatic heart disease and pulmonary thrombosis.

ELIJAH SHERMAN LAKE, Chicago; Loyola University School of Medicine, Chicago, 1921; aged, 50; on the staff of the Peoples Hospital, where he died, August 22, of chronic myocarditis and hypertension.

EDWARD FREDERICK LAW, Fairbury, Ill.; Rush Medical College, Chicago, 1903; past president of the Livingston County Medical Society; president of the township high school board of education; aged 63; died, August 5, of angina pectoris.

ERNEST MAMMEN, Bloomington, Ill.; Rush Medical College, Chicago, 1884; past president of the McLean County Medical Society; fellow of the American College of Surgeons; instructor in surgical diagnosis, Medical Department, St. Johns University, Shanghai, China, and community director of health education for China, 1923-1924; served on World War examining board; surgeon to the Brokaw and St. Joseph hospitals; aged 81; died, August 22, of coronary thrombosis.

RICHARD BARTLETT OLESON, Lombard, Ill.; Northwestern University Medical School, Chicago, 1893; fellow of the American College of Physicians; formerly county coroner; aged 67; died, August 6, at the Johns Hopkins Hospital, Baltimore, of benign prostatic hyperthrophy and staphylococcic septicemia.

CHARLES ALBERT ROBBINS, Dixon, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1892; veteran of the Spanish-American and World wars; aged 71; died, August 29, in the Veterans Administration Facility, Hines, of cerebral hemorrhage.

WILLIAM SPENCER RYAN, Chicago; Rush Medical College, Chicago, 1895; also a dentist; served during the World War; aged 68; died, October 23, in the Veterans Administration Facility, Hines, Ill., of cerebral hemorrhage.

WILLIAM ALLEN STOKER, Centralia, Ill.; Medical College of Ohio, Cincinnati, 1885; formerly managing officer of the Kankakee State Hospital, Kankakee, Ill., and formerly superintendent of the Anna (Ill.) State Hospital; aged 73; died, August 22, of cerebral hemorrhage.

ARTHUR TENINGA, Chicago; Rush Medical College, Chicago, 1919; aged 42; died suddenly, August 6, of coronary thrombosis.

CHARLES ALBERT WADE, Chicago; Rush Medical College, Chicago, 1891; member of the Illinois State Medical Society; formerly professor of pediatrics at the Bennett Medical College, medical examiner for the Prudential Insurance Company; aged 71; died, August 18, of cerebral homorrhage, hypertension and arteriosclerosis.

HERBERT LE ROY WALKER, Rock Island, Ill.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1904; on the staff of St. Anthony's Hospital; aged 56; died, August 11, of coronary thrombosis.

CHARLES DELAMERE WALL, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; aged 60; died, August 10, in Manteno, Ill.

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